



FRIDAY, APRIL 1, 1898.

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Contributions.

Why Gondola?

To the Editor of the Railroad Gazette:

Can you inform me what is the origin of the name "gondola" as applied to open freight cars? Is it because certain flat-bottom boats were used on the Pennsylvania canal and were carried by the portage railroad over the mountains? M.

Bearing Metals.

To the Editor of the Railroad Gazette:

We have read with scientific and business interest the letters which you have published relating to microscopic tests of bearing metals which show that the physical manipulation, as well as the chemical composition of journal metal, is of an importance not generally recognized. We learned this fact some time ago, and are prepared to furnish ingot metal and bearings which show, under the microscope, uniformity and perfect amalgamation. We believe that your correspondent has proved the cause of hot boxes.

THE AJAX METAL COMPANY.

Long and Short Haul in England.

London, England, March 14, 1898.

To the Editor of the Railroad Gazette:

Two months back I sent you some observations on the long and short haul question in England, which you were good enough to publish in due course. These observations were based on the abstract of the eleventh annual report of the Interstate Commerce Commission, published not only by the Railroad Gazette, but by many other papers, and which, if I understand rightly, is a document issued by the Commission itself in advance of its full report. The abstract, I ventured to say, showed that the Commission had misunderstood the English law and misrepresented the English practice. I have, however, now just received the full report of the Commission. Will you, therefore, allow me to say that, so far as this latter document is concerned, my criticisms must be considerably modified. Our law is, to the best of my judgment, quite accurately stated. I still think, however, that the report would lead an American reader, unfamiliar with English circumstances, to erroneous conclusions as to the practical effect of the English equality clause. So far as I know, it never was of much importance, and I can recall no instance of its appearance in practical politics within the last dozen years. And, as I said, the equality clause has nothing to do with long and short haul. Our only legislation on this specific subject is a section giving the Railway Commission a power—which they have never been so much as asked to exercise—to prohibit higher rates for the shorter than for the longer distance over the same line. To what I said as to short hauls being constantly charged more than longer in this country I fully adhere. Undoubtedly the differences in the rate have never been so great as in the States, the reason being that no English companies have ever competed by such exceedingly circuitous routes as seem in the States to be thought possible. For one thing, the imperative demand for equal speed in delivery would have stopped it; for another, English railways have always been free to agree to restrain competition by pooling or otherwise.

I notice also in the full report that the statement

as to the amount of pooling in England is made on the authority of "those who have charge of these matters in England." It is, of course, natural that the Commission should rely on English official authority, and it may seem presumptuous for a private individual to differ from the responsible officials of his own country. But I would point out that there is in England no obligation to publish pooling agreements; that there are certain obvious disadvantages in doing so, and that, under these circumstances, officials are perhaps less likely to hear of them than private individuals.

I trust you will be able to find space for this correction, as I should be sorry to appear to have criticised with levity the utterances of a body to which students of economic railway problems in every country are so much indebted as they are to the Interstate Commerce Commission of the United States.

W. M. ACWORTH.

The Louisville & Nashville in the Yellow Fever Epidemic.

The Louisville & Nashville Railroad has issued, for the benefit of its officers and employees, a souvenir of their experiences during the yellow fever epidemic of last autumn, in the shape of a pamphlet of 46 pages containing summaries of the reports of the division superintendents during that very trying period. The pamphlet opens with a four-page summary by General Manager Metcalfe, which is supplemented by reports more in detail from the superintendents at New Orleans, Pensacola, Montgomery, Birmingham and Memphis.

The interruption to traffic lasted from Aug. 23 to Dec. 12, but trains were kept running practically all of the time throughout these 15 weeks, and the substance of the reports here presented consists in accounts of the way this was done in the face of the restrictions of scores of local boards of health. Quarantine regulations were issued by states, counties, cities, villages and neighborhoods, and the only way to get along with them was to constantly humor the municipal officials and to change train crews at improvised terminals wherever they desired to set up a fence. Between New Orleans and Birmingham passenger trains had to change crews 12 times, as compared with two changes under normal conditions. Places had to be provided for trainmen and other employees to sleep and eat, as all these relay stations had to be a mile or two outside of the towns. Special water tanks had to be put up, Y tracks had to be laid for turning locomotives, and train supplies and car cleaning outfits had to be carried wherever needed.

About 250 employees of the company were sick with the fever at one time or another, and eight of these died. A list is given showing the name of each one and the result of his sickness. A list is also given of the total number of cases in each of the cities and prominent towns, but these reports are said to be very unreliable. The number of cases reported at New Orleans, for instance, was 1,835, but Supt. Marshall thinks that there were actually about 8,000 cases. At Mobile the number reported was 351, but it is estimated that there were 2,500.

On the line along the Gulf coast the municipal authorities compelled the train crews to change at very unhealthy places, and men who did not have the yellow fever did have malarial fever. To move a freight train between Decatur, Ala., and Pensacola, Fla., where the movement of export freight was at that time heavy, crews had to be changed at five places, at each of which the freight was fumigated by the use of formaldehyde. This fumigation seems to have been required at many places on other lines, though no details are given of this part of the work.

The company ran refugee trains throughout the epidemic. At villages where the fever had not appeared the people were opposed to these trains, but as soon as the epidemic came to their town they were strongly in favor of them. The men handling these trains were not permitted to go to their homes nor to mingle with other trainmen. The company took as good care of these men as it could, and indeed of all others, but they suffered some hardships. The company made special arrangements at detention camps and at hospitals to attend to all employees who were taken sick.

The superintendents had to be constantly on the alert to attend meetings of boards of health, consult with mayors, etc. They often received contradictory instructions from different authorities and sometimes had to act in positive disregard of some of them. Of the 400 men in the Mobile shops, a large majority kept at their work, though free transportation was given to all who desired to go to the North. The superintendents, masters of trains, master mechanics and roadmasters of the divisions affected are particularly commended, and "the same can be said of large numbers of the men." In former epidemics business had been so much reduced that but few employees were needed, but this time full forces were needed in both train and station service.

General Manager Metcalfe concludes from his ex-

periences that a national quarantine would probably be better than the present arrangement of state and local quarantines.

We quote some items of interest from the letters of the superintendents. Local health officers very generally enforced the rule that passenger trains must pass through without stopping and that doors and windows must be shut and fastened. Mail cranes had to be erected, so that mail bags could be taken on without stopping trains. Infected places often maintained strict quarantines against well persons so as not to add fuel to the flame. During the epidemic 11 steamers were loaded at Pensacola for Liverpool and other European ports, the export business at that station being much larger than during the same time of any previous year. No figures are given in the book of the extra expenses necessitated by the fever, but in one case it is stated that 15 freight cars were fumigated at an expense of \$1 a car. At some small towns the road had to send food to its men, because, although food was plenty in the region, the men were not allowed reasonable intercourse with the people, and therefore could not buy what they needed. The troubles of passengers form a considerable portion of the history given by the superintendents. A young man who went from Birmingham to Chicago started back to Birmingham via Holly Springs, but was not allowed to get off at the junction; went on to New Orleans and started back to Birmingham, but, being on a refugee train was carried through to Chicago and there had to stay 10 days before he finally was able to start to Birmingham over the Louisville & Nashville. Two passengers from a small town in Tennessee started for Texas; they went through New Orleans all right, but at Lake Charles, La., were turned back and finally got back to Tennessee, but had difficulty in getting themselves let off the train at the village they had started from. A good deal of the time the trainmen of the refugee trains had to ride on the platforms and in the baggage car. At Decatur conductors had to take care not to enter the telegraph office, orders being handed to them outside. Although the weather was warm, the car cleaners were not allowed to carry ice into the cars and had to lay the blocks on the platforms. Freight traffic was much hampered and delayed, especially at Birmingham. The regulations of different cities and towns made necessary a complete revision of the plans of loading cars and of making up trains for sending by different routes. The Birmingham city officials made no trouble at all, leaving all protection to the state officials.

The earnings of the Louisville & Nashville, as a whole, kept up well, there being, in fact, an increase for the three months, September, October and November, but this was due to the general improvement of business; on the divisions principally affected by the yellow fever the decrease for the three months was \$253,329.

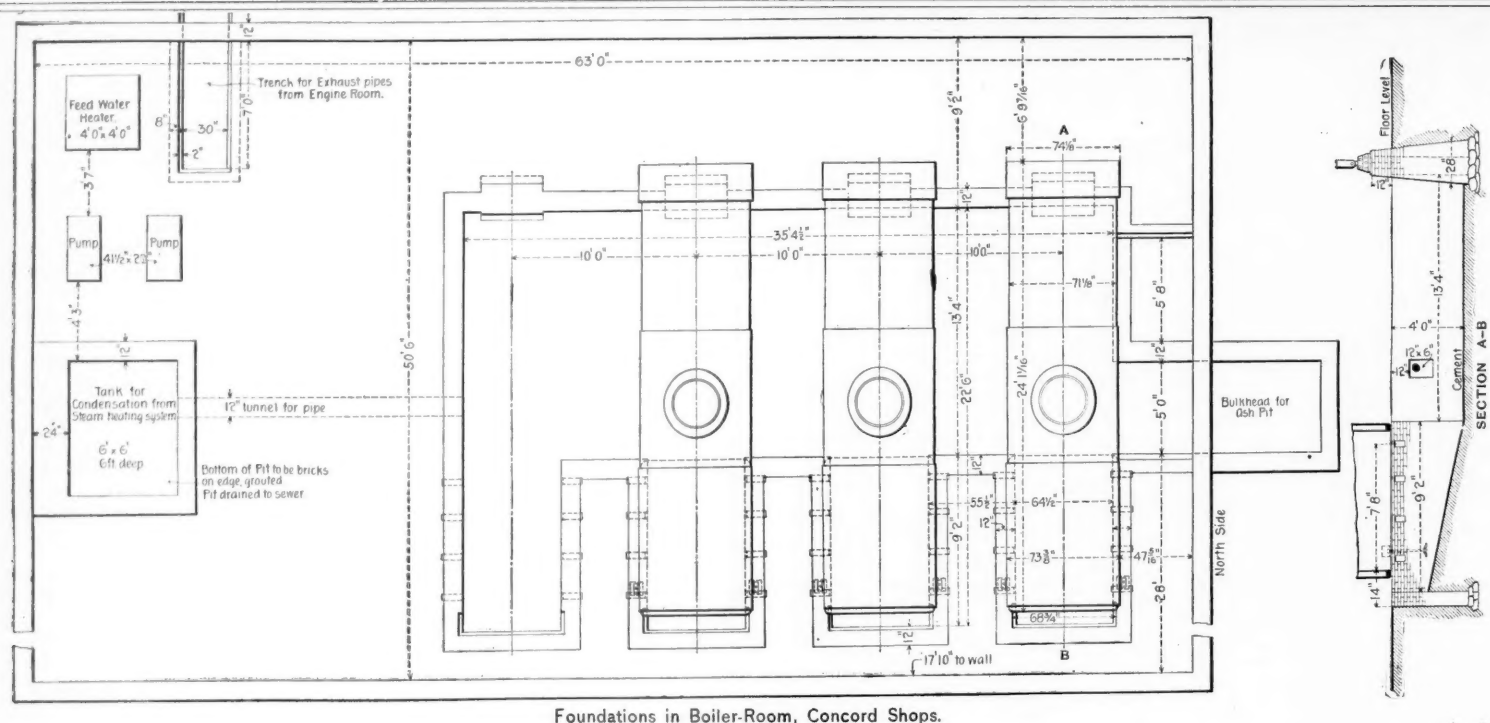
New Boston & Maine Shops at Concord.*

Boiler Plant.

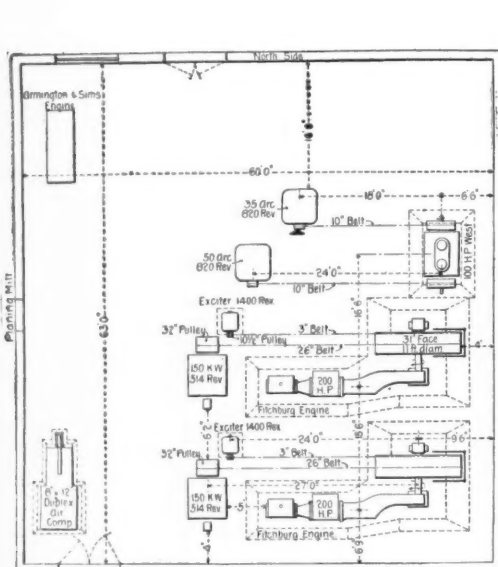
The boiler house is 65 ft. x 50 ft., and situated as shown in the inset accompanying the article of Feb. 4, one roof covering the boiler and power house, the two being separated by a brick wall through which the steam mains pass. There are three locomotive type radial stay boilers with spaces for two more and an ashpit for a fourth when it shall be needed. The boilers are 70 in. in diameter in the barrel, and are built for a working pressure of 180 lbs. per sq. in. The smokebox end is supported upon a swinging link and the firebox end stands over a bricked-up pit. The boiler room has a cement floor and the pits under the boilers are arranged to admit small iron dumping carts under the fireboxes to receive the ashes. The pits are shown in section in the plan view of the boiler room. The space under the front portion of the boilers is excavated to a depth of 4 ft. and a 5-ft. trench passes from this excavation under the north wall of the building for removing the ashes by means of a hoist that raises and loads them upon cars. The excavation is large enough for a week's accumulation of ashes. At the boiler fronts a space of 17 ft. 10 in. is provided and in this a trestle is built for running coal cars directly into the boiler house and delivering the coal at the furnace doors.

The boilers each have a total heating surface of 1,834 sq. ft., the grate area is 40 sq. ft., and the tubes are 14 ft. long. They connect to transverse breeching, which leads to a 70-ft. stack. The smoke passes through an induced draft smoke fan driven by a direct connected engine, the bearings of which are cooled by a circulation of water. The boilers are fed by two duplex outside plunger, brass fitted Deane (Holyoke) pumps, with cylinders 7½ in. and 5 in. x 6 in. Each pump is capable of feeding all of the boilers. Water is taken either from the 700 H. P. Cochran feed water heater situated in the corner of the boiler room, or it may be taken from the city mains. This feed water heater takes the exhaust from the engines in the power plant and a direct exhaust discharge is provided to the roof for use if necessary. The heater

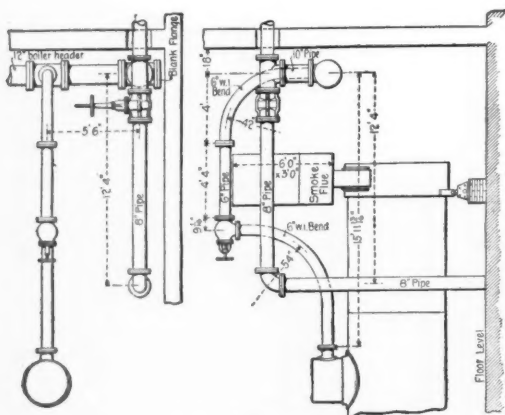
*Continuation of illustrated articles published in the Railroad Gazette February 4, p. 76, and March 4, p. 154, and in the American Engineer at the same time.



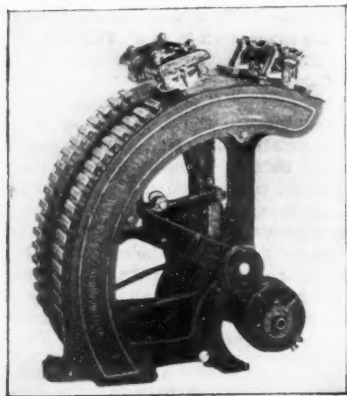
Foundations in Boiler-Room, Concord Shops.



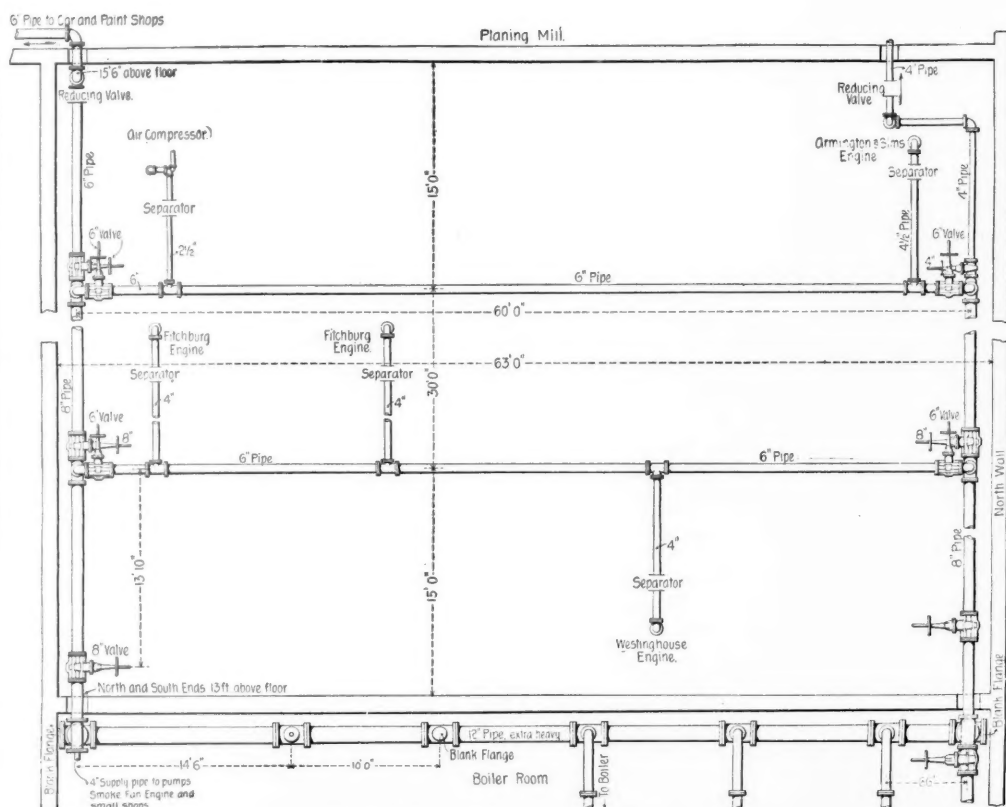
Plan of Power House, Showing Location of Machinery.



Boiler Connections.



Controller for Crane Motors.



Piping in Power House, Concord Shops.

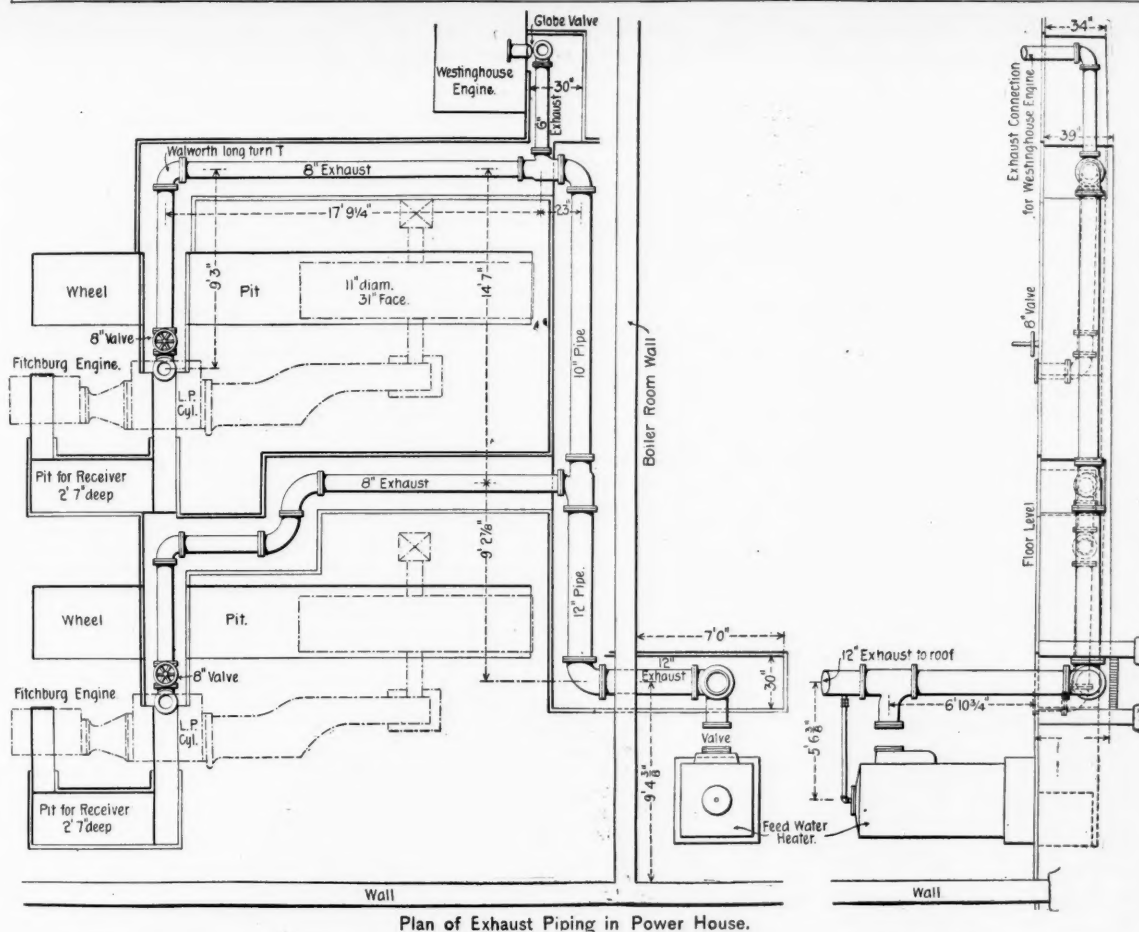
was furnished by the Harrison Safety Boiler Works, Germantown Junction, Philadelphia. The condensation water from the whole of the heating pipes except from the heaters themselves is returned to the brick hot well or tank, which is shown in the plan of the boiler room. From here it is pumped through the feed water heater and into the boilers. This tank also receives the drainage from the engine receiver jackets and the exhaust pipes and the water circulating through the smoke fan bearings. The smoke fan is supported upon a platform made of old rails, and it connects the breeching with the stack, causing an induced draft. Its arrangement is shown in the photograph, which also shows the large exhaust pipe and at the left a vapor pipe from the hot water tank to the roof is seen. This fan is 6 ft. in diameter, and is driven by a 5 in. x 4 in. double engine. It is rated for 750 H. P. boiler capacity.

From the steel nozzles at the front of the dome of each boiler connection is made to the 12-in. header by means of two 6-in. wrought iron bends, with angle valves and a short piece of straight pipe between them as shown in the engraving of the boiler connections. The 12-in. steam header runs along the east side of the brick partition wall and is about 65 ft. long, blank Ts being provided for the attachment of two more boilers. From both ends of this boiler room header short upright 10-in. pipes connect with 8-in. mains running westward along the north and south walls of the engine and dynamo room, or "power house," as it is designated on the inset already referred to. In the power house two 6 in. cross-over pipes connect these engine mains, and these, together with the mains, form a loop; and as the en-

gines take steam from the cross-over connections it is evident that the mains are practically in duplicate. There is a rise from the boilers and two more between the boiler header and the engines, but to guard against any possible chance for water to reach the cylinders separators are placed between the 6 in. cross pipes and the engine throttles.

Power House.

In the power house are two tandem compound "Fitchburg" 200 H. P. engines, a 100 H. P. simple "Standard" Westinghouse and a 125 H. P. Armstrong & Sims engine, an 8 in. by 12 in. Rand duplex air compressor, two 150 kilowatt Westinghouse Electric & Manufacturing Co.'s generators, with exciters, a 50-arc-light (Weston), and a 35-arc-light (Weston) dynamo; and considerable space is provided for future additions to the plant. This is also provided for in the steam piping. The plan view of the power house gives the location of the machinery; the plan view of the piping shows the arrangement of the mains, the separators and valves. The arrangement of the exhaust piping from the Fitchburg and Westinghouse engines leading under the floor to the feed water heater in the boiler room is shown in a separate drawing. The exhaust from the engines joins in passing to the heater, and an out-of-door exhaust is provided, whereby the heater may be cut out. This piping is carried in trenches large enough for a man to work in and covered by sectional cast iron plates made for easy removal. The exhaust from the air compressor and the Armstrong & Sims engine is carried to the planing mill heater, or it may be discharged through the roof during warm weather. The



Plan of Exhaust Piping in Power House.

steam piping in the power house, with the exception of the cross-over connections, is given a slope of $\frac{1}{16}$ in. in 12 in., in the direction of the steam current. The cross-overs are 2 ft. 6 in. above the north and south mains and are level. The north and south mains are 13 ft. above the floor. There are no expansion joints in this system. The piping is hung from the roof trusses by roller hangers, and all of the piping and fittings are made extra heavy, with a view of a possible future increase in the working steam pressure. All of the fittings and valves above 4 in. in diameter are flanged, the flanges being grooved with tool marks to hold the packing, which is of the "Rainbow" brand, manufactured by the Peerless Rubber Manufacturing Co. The exhaust pipes through the roof are provided with exhaust heads, of which there are three, one 12 in., one 7 in., and one 6 in.

The engines, furnished by the Fitchburg Steam Engine Co. of Fitchburg, Mass., are of the tandem non-condensing compound type, with automatic cut-off and four valves. They have girder frames. The high pressure cylinders are 13 in. and the low pressure 22

in. in diameter, the stroke being 30 in. They run at a speed of 125 revolutions a minute, taking steam from a 4-in. pipe and exhausting into an 8-in. pipe. The fly-wheels are 11 ft. in diameter and have 31-in. faces, each taking a 26-in. belt for the generators and a 3-in. belt for the excitors. The main bearings are $7\frac{1}{2}$ in. in diameter by 16 in. long, and are filled with Babbitt metal and have adjustable side boxes to take up wear. The crank and crosshead pins, piston and valve rods are of steel and the connecting rods are of scrap iron, with hard bronze bearings for the crank and crosshead pins. The valves are of the balanced, expansible, piston type, with positive adjustment of diameter to take up all wear that may occur during the life of the engines. The steam valves are double-ported and are actuated by a wrist plate cam motion, giving good regulation under

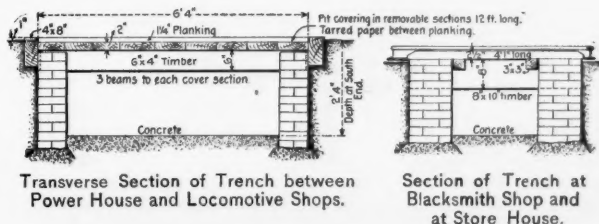
the most abrupt changes of load. The exhaust valves are at the bottom of the cylinders, draining all water, and they are operated by an independent eccentric, giving free opening without altering the compression at the end of the stroke with changes of load. The engine bed is very heavy, and the crosshead shoes have a very large area. Each engine has a steam jacketed receiver, connected between the cylinders. The engines are to regulate within $1\frac{1}{2}$ per cent. from no load to full rated load and vice versa, no matter how abrupt the change of load may be.

The 100 H. P. Westinghouse engine is used to run the arc light dynamos, both of which run at a speed of 820 revolutions a minute. Its location and the connections for steam and exhaust are shown in the engravings. The 125 H. P. Armstrong & Simms engine, located in the northwest corner of the power house, runs the planning mill, as was explained in the second article. It is thought that one electrician, with two assistants, one engineer and one fireman for day work and one for night will be able to operate and care for the power plant, and this does not increase the force above the number of men formerly employed for the purpose in the old shop plant, which was a very much smaller one.

The air compressor was furnished by the Rand Drill Co. It is an 8 in. x 12 in. duplex "Class B" steam air compressor, and is so designed as to permit of disconnecting either air cylinder if desired. The main frames are of the Corliss type, and are bolted to the cylinders by means of strong studs and faced nuts. No Babbitt metal is used about the machine; the pistons are solid and fitted with snap rings. The air cylinders are jacketed for cooling water, which is conveyed by pipe to the hot water reservoir in the boiler room for use as feed water for the boilers. The compressor has the Meyer adjustable cut-off valves, and it is regulated to a pressure of 100 lbs. of air by a pressure governor. The fly-wheel is solid and weighs 2,000 lbs. The weight of the complete machine is 6,500 lbs.; it is 12 ft. 5 in. long, and 4 ft. 8 in. wide; its capacity is 195 cu. ft. of free air per minute, pumped against a pressure of 100 lbs.

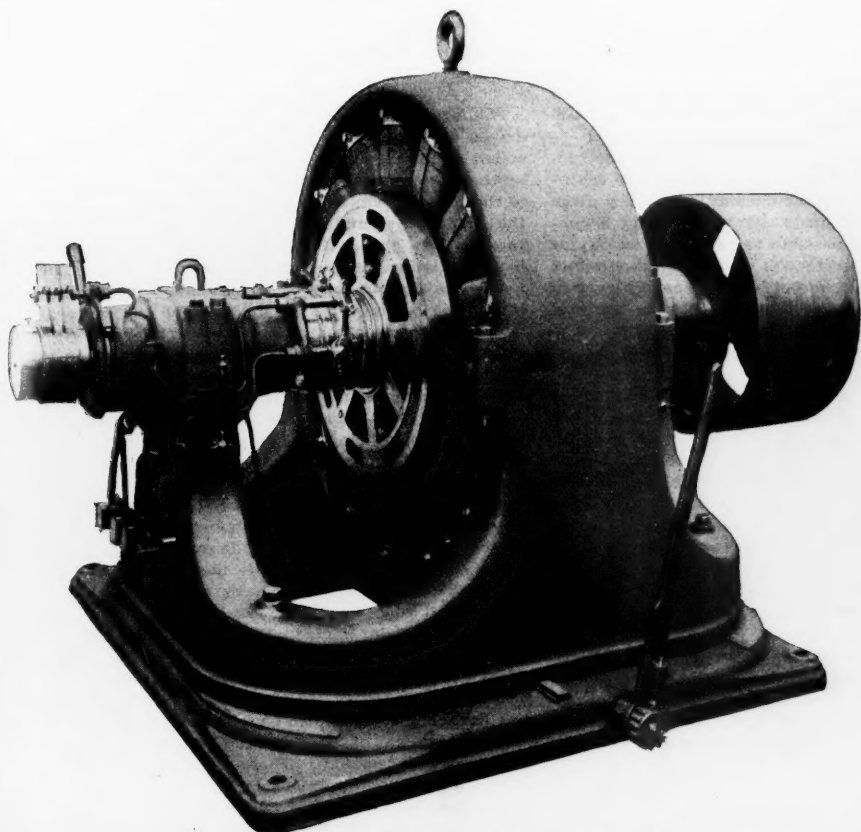
Generators.

Besides the two arc-light machines there are two generators in the power house supplying power for the motors. These are wired so that power and incandescent lamps may take current from both, or one may run the lights while the other operates the motors. The latter arrangement is necessary, owing

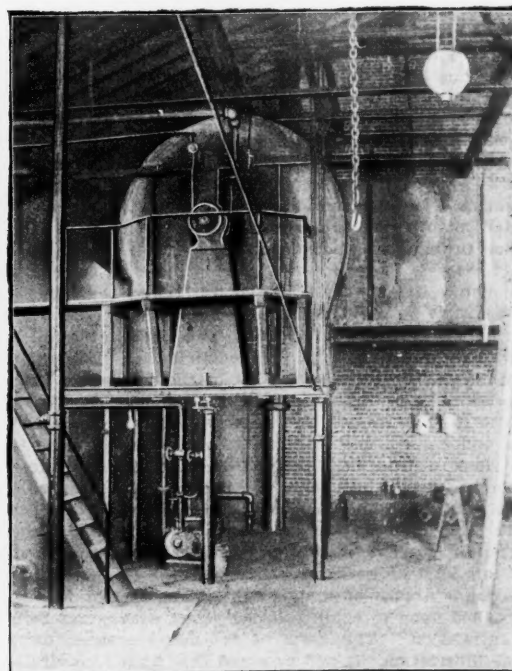


Transverse Section of Trench between Power House and Locomotive Shops.

Section of Trench at Blacksmith Shop and at Store House.



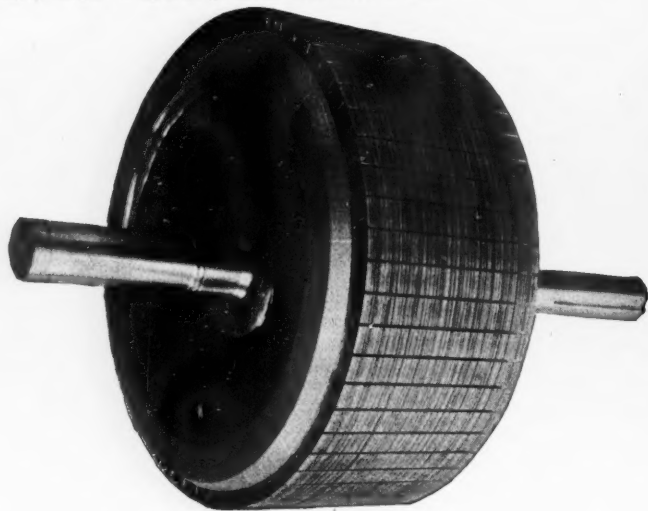
Belt Driven Polyphase Generator.—Concord Shops.



Smoke Fan in Boiler House.—Concord Shops.

to the dimming of the lamps while raising a heavy locomotive on the cranes if the lamp and motor circuits are combined. These generators furnish power for all of the motors enumerated further on in this description. They were furnished by the Westinghouse Electric & Manufacturing Co., each with a capacity of 150 kilowatts at 440 volts. They are of the two phase alternating type, the construction being shown in the engraving. Each alternating dynamo has a 5.62 kilowatt field exciter driven at a speed of 1,400 revolutions a minute by a narrow belt from the engine belt wheel. The electric plant includes one No. 2, a No. 6, a No. 8, a No. 12, two No. 16 and two No. 100 converters. The electric crane circuits are wired for a maximum of 200 amperes at 440 volts, the transfer table takes 60 amperes at 440 volts and all of the other motor circuits are 440 volts each. The incandescent lighting at the shops is done by a 440 volt current transformed to 104 volts, while that at the Concord station and in the Young Men's Christian Association Building, about a half mile from the shops, is transformed from 440 to 1,000 and then down to 104 volts. Besides about 30 arc lights at the passenger station and others in the yards, these are used in the erecting, machine and boiler shops, the blacksmith shop and all of the buildings except the lumber shed, dry house and paint store house. The arc lights are spaced 50 ft. apart for inside and from 150 ft. to 200 ft. apart for outside lighting. There are about 450 incandescent lamps at the station, freight house and round house, and about 300 in the various shop buildings.

The general appearance of the generators furnished by the Westinghouse Electric & Manufacturing Co. is shown by the accompanying illustration. The lower half of the field casting and the supports of the bearings constitute a single casting, insuring accurate centering of the armature. The field poles are of soft laminated steel, cast into the field yoke or frame. The magnetic circuit is of ample section to prevent saturation. The bearings are self-aligning and self-lubricating and the bearing surfaces are unusually large. A special grade of soft steel is used



Armature for Motors.

in building up the armature core, and the methods of construction avoid injury to the steel, which would increase losses due to magnetization. The armature coils lie in slots and are held therein by means of retaining wedges of hard fiber driven into notches near the top of the slots, longitudinally with the armature. No band wires are used and both core and winding are thoroughly ventilated. The field and armature coils are wound upon moulds or formers and thoroughly insulated before they are put in place. Machines of this type operate at moderate speeds, which is a feature of great practical value.

The switchboard has an iron frame, supporting five marble panels, with indicating and switching devices for the dynamos. The transmission of the currents for lights and motors is over a wire system strung on a pole line through the shop grounds.

Motors.

The shop motors are the Tesla Polyphase Induction type, furnished by the Westinghouse Electric & Manufacturing Co., running on 400 volt, two phase currents, with 7,200 alternations. The distribution of the motors is as follows: One 30 H. P. on the east side and one 20 H. P. on the west side of the locomotive shop, one 20 H. P. motor on the large bending rolls in the boiler shop, one 15 H. P. motor in the blacksmith shop to drive the fans, one 20 H. P. in the same shop to drive the machinery, one 5 H. P. motor in the small shop buildings, besides the crane and transfer table motors.

The alternating current motor is specially well adapted to this kind of work, and the type used in this installation is worthy of study by those who are soon to be called upon to equip railroad shops with electric transmission. The form of the motor is shown in the illustration. It will be noted that from a mechanical standpoint, this motor is reduced to the simplest possible elements, i. e., a stationary part permanently connected to the main circuits, and a

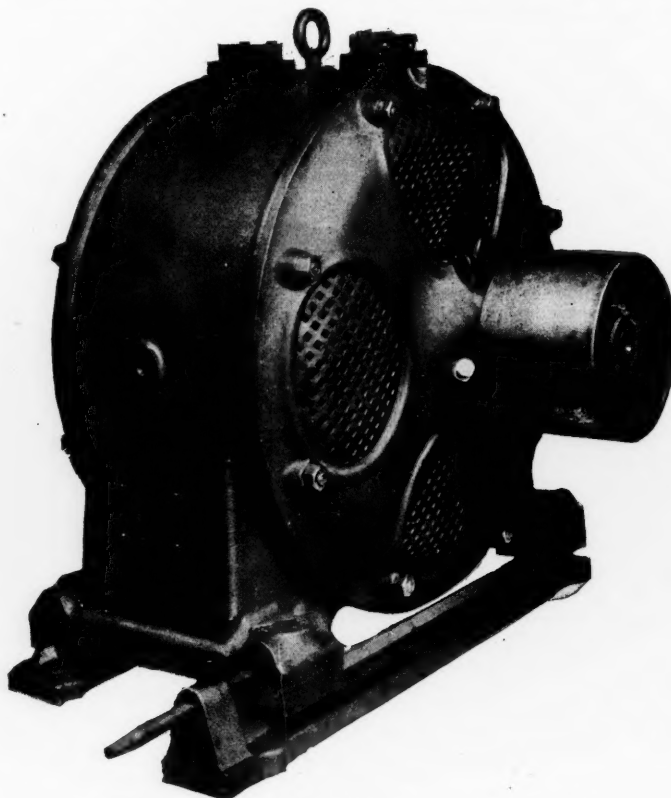
rotating part having no electrical connection with any other, and absolutely no electrical contacts or adjustments; in fact, no sliding or working friction except that of the shaft in the journals. The only parts that can wear, therefore, are the shaft and journal boxes. The friction in these is very slight, on account of the light weight of the rotating part. Ample self-oiling bearings provide for liberal lubrication. It will, therefore, be observed that as a piece of moving machinery, the motor is designed and built to operate for long periods of time with but a very small amount of attention. These are known as "Type C" motors.

The hollow cylindrical frame of cast iron, in which the primary is mounted, forms a base for the machine and also supports the two end brackets carrying the self-oiling bearings. Perforated iron plates fitted into these brackets both protect the rotating element and permit excellent ventilation. They may be replaced by solid plates when it is desired to make the motor absolutely dust-proof. It will be noted that the housing completely encloses the primary and secondary elements and protects them from any external damage.

The primary element consists of a hollow cylinder built up of laminated sheet iron rings slotted on the inside to receive the conductors. These rings are rigidly supported by the cast iron housing which encloses the primary. The conductors are machine

which the pressure of the current is varied. The control of the motor is somewhat similar to the control of a variable speed engine by the throttle, which reduces the steam pressure delivered to the engine, thus enabling its speed to be varied at will over a wide range. The motor receives from the regulator a pressure varying from a small amount up to the maximum for which the motor is adapted. This variation gives a starting torque which has a maximum value equal to about four times the torque which the motor can develop at high speed continuously. The motor has a certain maximum speed which it does not exceed, even though the full pressure be applied and there be no load. This assures that no accident will occur from abnormally high speed. The regulator provides a wide range of adjustment by small steps, so that practically any torque at any speed can be obtained over a very wide range.

The regulator consists of a special form of transformer by which the voltage is efficiently reduced. A number of terminals are brought out from the transformers which are carried to the regulator, so that the pressure from the various contacts can be successively applied to the motor. The crane motors are exactly similar in construction, operation and simplicity to the constant speed motors. The difference between the constant speed and variable speed motors is in certain details of construction. Three or four wires are all that are required between the



Constant Speed Polyphase Induction Motor, Type "C."

wound coils, which are thoroughly insulated before being placed on the core. The terminal blocks which are located on top of the machine are connected to the primary winding by leads which pass through the housing.

The design and principles governing the construction of the type "C" motor are favorable to maintaining a high and almost constant efficiency from full load to one-half load. By maintaining a constant efficiency, it is possible to secure an all day or average efficiency very much above that heretofore possible, with either direct or alternating current motors. The variation of speed between no load and full load is small, being less than that found in direct-current motor practice, as determined by exhaustive tests.

A polyphase induction motor may be started by connecting it directly to the circuit with an ordinary switch. Small motors are so started in practice. The larger motors are started on a reduced voltage, the full E. M. F. of the circuit not being applied until the motors have reached a considerable speed. The fact that in a four-wire two-phase circuit different E. M. F.s exist between different pairs of wires, affords an easy way of obtaining the necessary reduction in E. M. F. For some classes of two-phase and for three-phase service the reduction of voltage is effected by a device called an auto-converter. This device is entirely separate from the motor itself. It is possible, by the use of the auto-starting device, to adjust a motor after installation to have any desired starting torque within very wide limits. Thus, a motor operating machinery having great inertia may be made to give a correspondingly strong starting torque, while one driving a very light device may be adjusted for extremely small starting torque, with a corresponding reduction in starting current.

The alternating-current crane motors are provided with a regulator, illustrated by one of the cuts, by

circuit and regulator and also between the regulator and the motor.

Heating.

The large shop buildings are all heated by hot air driven by fans, while the store house has ordinary steam radiators. The fan equipments were furnished by the Boston Blower Co., and are all alike, except as to the heaters, which vary in size in accordance with the sizes of the buildings. In each room, adjacent to the fan, is a group of steam radiators, fed by pipes from the boilers, and encased in a suitable box. The fan forces air into this box and thence through sheet iron pipes to the different quarters of the room or building. There are two heaters in the locomotive shop, offering the advantage of closer regulation of the heating in moderate weather than would be possible to obtain with a single large heater.

Each of the locomotive shop heaters has 22 sections, each having 80 eight-foot pipes and giving a radiating surface of 14,740 lin. ft. of 1-in. pipe. The blower is the Boston steel plate exhaustor with full housing. The height of the fan is about 10 ft., the fan wheel is 72 in. in diameter by 34 in. wide at the periphery, and 42 in. wide over all. The inlet has a diameter of 50 in., while the outlet is 44 in. x 40 in. The housing is of heavy steel plate, braced with T and angle iron. The fan is directly connected to a 7 in. x 7 in. engine. The steam manifolds are subdivided and piped so that either live or exhaust steam may be used in the several sections of the heaters.

To reach the heaters in the different shops an extensive system of underground steam and return piping was necessary. These pipes are conducted through trenches of ample size, all of which are given pronounced slopes for drainage not only of the pipes, but of the trenches themselves. They are provided with concrete floors, brick side walls and plank covers. The heating pipes extend north from the

power house a distance of 780 ft. and south 890 ft. They carry a pressure of 30 lbs. per sq. in. All of the condensation, except that from the heaters themselves, is returned to the boiler house hot water tank. The steam piping was put in by Messrs. Isaac Coffin & Co., of Boston.

By returning to the plan of the piping in the power house and also to the large general plan of the shops and grounds, the arrangement of the steam piping will be understood. The north 8-in. main in the power house extends through the planing mill wall and supplies the planing mill heater and the dry house radiator coils. From the south 8-in. main a 6-in. extension runs south through the planing mill and at the extreme south end of the mill it passes underground through a brick trench to the car repair shops, entering that building on the east side of the partition wall between the freight and passenger car shops. It serves the heaters in these shops and passes on to the paint shop, as indicated in the large plan. Each heater has a separate trap, the drainage being discharged into the sewers. Only one expansion joint was used in this line, it being necessary to put one in the long straight run in the planing mill. A 2½-in. pipe reduced to a 2-in. is run along under the larger pipe for use in heating water and glue during warm weather.

The steam pipes running north connect with the north header in the boiler room and pass directly down and into the trench, which is marked "conduit" in the large plan view (Feb. 4). This conduit is 2 ft. 4 in. deep at the power house, and is 4 ft. 9 in. deep at the locomotive shop, a good slope for a distance of 378 ft. A 6-in. pipe runs through the north trench and it makes two turns in order to avoid expansion joints. The main changes from 6 in. to 5 in. at the blacksmith shop connection. Traps are located at the wall of the locomotive shop and also at the extreme end of the line at the heaters. For anchorages large stones were buried, each about 4 ft. square and 1 ft. thick, care being taken to provide side bracing along the pipe line to hold its alignment. The pitch of the pipes was a little greater than that called for in the specification, viz.: $\frac{1}{8}$ in. in 1 ft. An expansion joint was found necessary in the long straight run in the locomotive shop. Nason steam traps are used throughout on the steam piping, except one trap for the 12-in. boiler heater. The traps, except one, are all arranged to discharge either into the sewer or the hot well as desired.

Special care was taken in regard to protecting these long lines of pipe from condensation, "Magnaesia Sectional Covering" being used, both for power and heating pipes. Nearly 4,500 lin. ft. of pipe covering of varying diameters was used. Of this nearly 800 ft. was for 6-in. pipe. This was all furnished by Messrs. Keasbey & Mattison Co., of Ambler, Pa. A very large number of valves, Ts, crosses and other fittings were also covered.

In closing this description it should be stated that the work was all carefully planned beforehand and every part of the installation was carried out according to the drawings. This included the piping, and it is stated that the plans were not changed at all during the progress of the work.

Acknowledgments are due to Mr. Henry Bartlett, superintendent of motive power, Mr. J. T. Chamberlain, master car builder, Mr. C. H. Wiggin, master mechanic at Concord, and Mr. G. E. Mitchell, chief draftsman of the motive power department, for information and other assistance in preparing these articles.

Strobel's Locomotive Turntables.

The illustrations show recent locomotive turntables built from designs of Mr. C. L. Strobel, C. E. The turntables shown are 60 ft. long, Fig. 1 being the through and Fig. 2 the deck type. Both are departures from the usual practice, in that no trailing wheels are used and also in the manner in which the load is supported at the center to secure the steadiness required in the absence of trailing wheels.

The details of the centers are shown by the drawings for through and deck, and are quite similar, being of the cone-roller type, in which the rollers are held in their relative positions by means of a spider. The usual method is to support the table at one point, as is common for pin centers, or at two points at right angles to the center line, as is done with cone centers, in each case depending upon the trailing wheels to steady the table; in the present design the support is provided by four points of contact, which form a square whose side is 24 in. The bearing points are raised portions of the cap, upon which rest short girders, which form a part of the turntable framing. These four points balance the table and its load both transversely and longitudinally. The tilting motion, to which all tables are subject, as an engine moves on or off, is permitted by the manner of support, this motion taking place around the two points of support for a fulcrum which are nearest the side from which the locomotive moves on or off the table. It is quite necessary, where trailing wheels are not used, to center the locomotive; that is, its center of gravity must be approximately over the center of the table, and for this condition the table is in position to ro-

tate upon the rollers with steadiness, so that no other support is required. The roller circle has an outer diameter of 3 ft. 6 in., so that the load comes upon the rollers well within the outer circumference, and even for the tilted position of the table overloading does not occur.

Only the small resistance of rolling friction, under favorable mechanical conditions, and acting with a small leverage, is presented, as the moving parts run in oil, and are incased so as to be protected against dirt.

Instead of the circular rail which is usual under

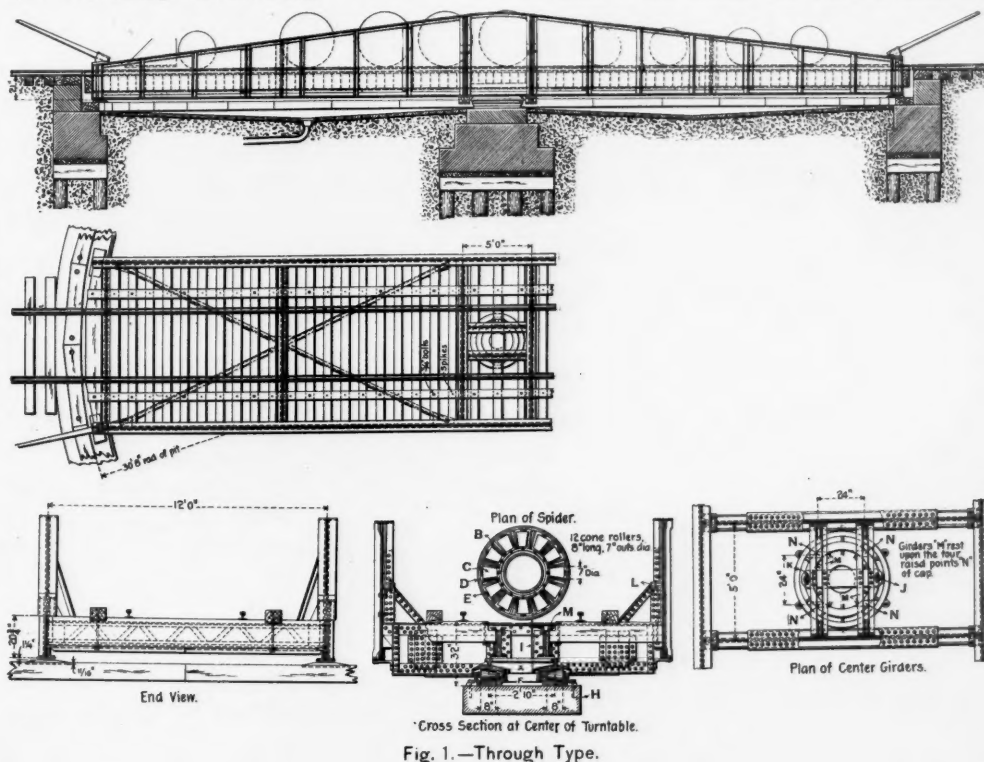


Fig. 1.—Through Type.

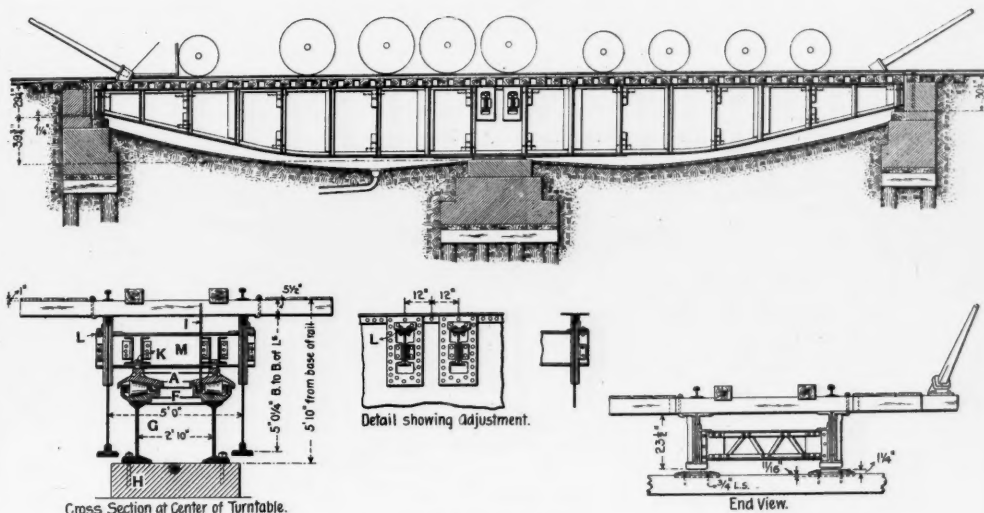


Fig. 2.—Deck Type.
Strobel's Locomotive Turntable.

A—Cap.
B—Spider.
C—Cone rollers.
D—Hoop, wrought iron.

E—Steel plugs.
F—Base castings.
G—Center stand.
H—Anchor bolts.

I—Oil pipe.
K—Cotter pins.
L—Adjustment plates.
M—Supporting girders.
N—Contact points on cap.

The first turntables of this type were built in 1894. For these the distance between supports longitudinally was taken at 15 in., and the tables built with these proportions, we are advised, have given satisfactory service. The present center has been made larger and stronger than the first centers used, in order to accommodate the heavier locomotives which have since come into use, and the

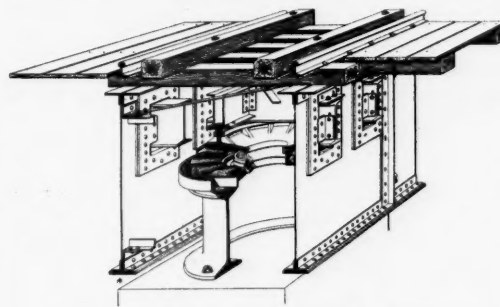


Fig. 3.—Detail of Deck Turntable Center.

distance between supports longitudinally has been made 24 in. instead of 15 in. The rollers now used are of steel 8 in. long, having outside diameters of 7 in., and 4½ in. inside diameters. There are twelve rollers, making 96 lineal inches of bearing, which is more than double what has been usual for cone-center turntables. The bearing surfaces which press against these rollers are solid castings turned in a lathe and polished.

turntables with trailing wheels, the tables described are provided with bolster plates. These are made of ample size and strength to distribute the pressure over the wooden sills supporting them. These plates are used only at those points in the circumference where the support is required, which would be opposite to each track of the roundhouse. A set of four plates is needed for every track. If the turntable is to accommodate only two or three tracks the circular wall need not be made continuous, thereby saving expense. The space between the bolster plates and the underside of the turntable girders is made about ¼-in. greater than what is sufficient to allow for the deflection of the girders under maximum load. With the heaviest engine on the table it is intended that there shall be ¼-in. clearance as the girders pass over the plates; between the plates there is of course greater clearance. The plates are chamfered, so that if the girders should accidentally strike them the motion of the table would not be arrested.

These turntables are adjusted at the four ends of the transverse girders, at the center, by means of adjustment plates. It was thought desirable to avoid the use of adjustment screws, as these are almost invariably tampered with by unauthorized persons. Having these four points of adjustment, it is possible to raise or lower either end of the two main girders. This is an important advantage for any turntable, and is an essential one for the proper working of a through table.

Among the advantages which a turntable without trailing wheels possesses may be mentioned that the depth of pit at the outer circumference is small,

thereby securing economy, as compared with turntables having trailing wheels, by the smaller quantity of masonry and excavation required for the pit. The saving in masonry amounts to about 82 cubic yards. If the amount of masonry required for the turntables without trailing wheels be represented by 100, that needed for similar tables with the trailing wheels placed below the girders will be represented

by 201, and 182 will represent the masonry required for those with the trailing wheels placed up alongside the girders. The expense of keeping the pit clear of snow in the winter is also lessened.

By making the girders for a 65-ft. table without trailing wheels somewhat shallower at the ends than for the 60-ft. table, simply continuing the slope of the lower flange of the 60-ft. table, the masonry

needed that each engine wheel, in rolling upon the table, drops down upon it about one inch, and exerts a heavy blow in so doing. From these premises, the conclusion was reached that modern turntables should be constructed without trailing wheels. Having adopted this type of table, it was found that important advantages would result therefrom. It became impossible to use

trailing wheels, acting with so large a leverage upon an imperfect track, would make it very difficult to turn the table. From an investigation made by figuring the center of gravity for locomotives, both with empty tender and with loaded tender, it has been found that all locomotives of usual weight and proportions can be accurately centered upon a turntable of 60 ft. length. But if provision is to be

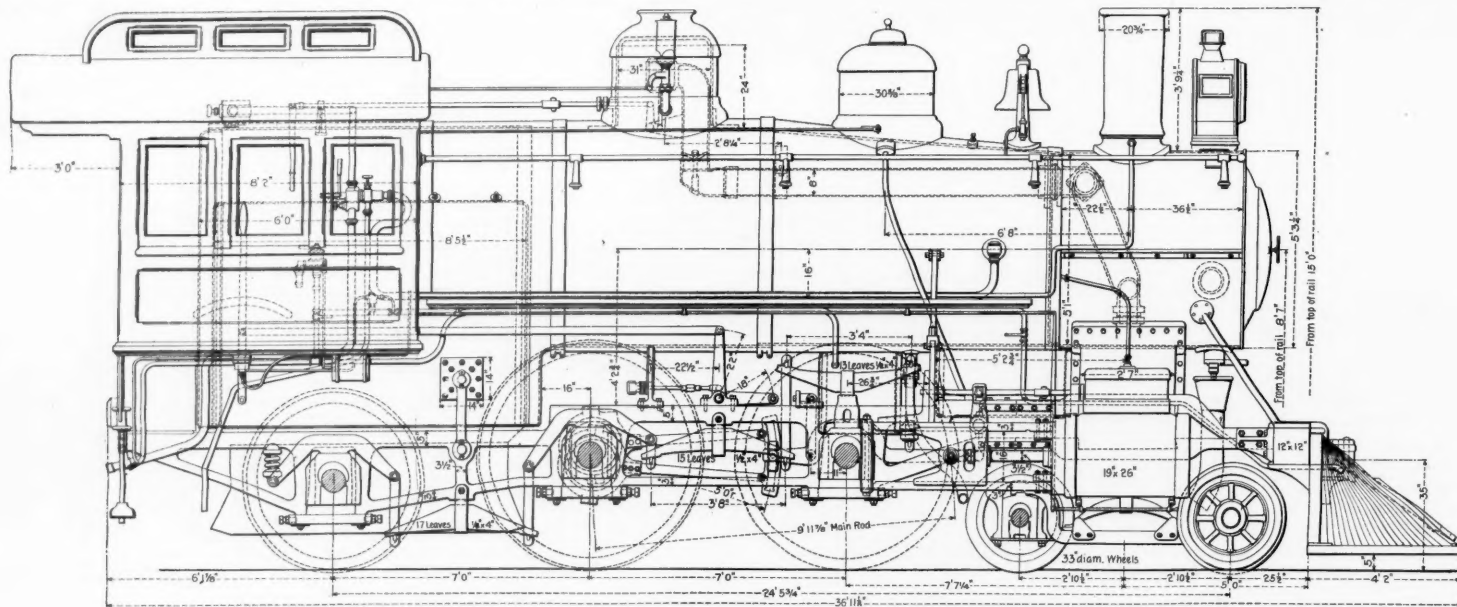


Fig. 1.—Class "G" Passenger Locomotive—Wabash Railroad.

Designed by MR. J. B. BARNES, Superintendent Motive Power and Machinery.

a pin or friction center, but that type of center, it was thought, could be used but little longer because of the heavy engine loads which are now to be provided for. Calculations show that for any proportions which may be adopted for a friction center such that the bearing surfaces will not grind themselves to pieces, the diameter of the bearings becomes so large that the table cannot be

made for accommodating the largest locomotives, it is desirable to adopt a greater length for new turntables, and 65 to 66 ft. has now become the standard on certain leading railroads. A 65-ft. table would be required for the 154-ton mastodon locomotive of the Great Northern, and on many roads it is desired to use a table not only for turning locomotives, but also for turning certain passenger cars,

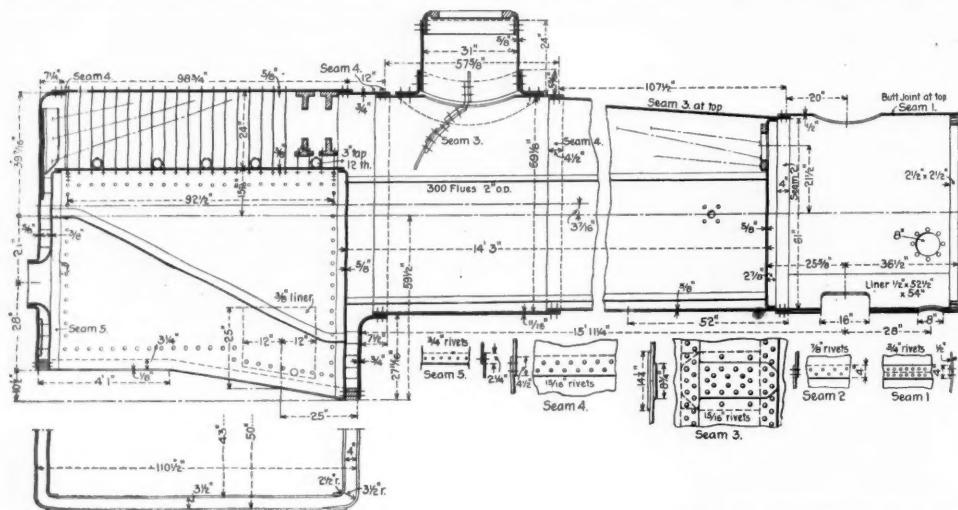


Fig. 2.—Boiler of Class "G" Freight Locomotive—Wabash Railroad.

required for a 65-ft. table is no more than that required for the 60-ft. table, and the difference in cost of the two tables is therefore very slight.

It is evident that turntables, capable of accommodating modern locomotives, should be designed on lines other than those which were suitable for the light locomotives used ten or twenty years ago. As illustrating the increase in the weight of locomotives which has taken place, it is interesting to note that the bridges built on the Cincinnati Southern in 1874 to 1879 were proportioned for an engine weighing, with loaded tender, 66 tons of 2,000 lbs., and for a freight train load of 1,800 lbs. per lineal foot. At the present time the freight train load called for in certain bridge specifications is as high as 5,000 lbs. per lineal foot, and a locomotive is in actual use, the mastodon locomotive of the Great Northern, weighing with the tender 154 tons, and having a wheel base of 54 ft. 3 1/2 in., and a length, over all, of 64 ft. (See Railroad Gazette, Jan. 7.) Here is an increase, in less than twenty years, of about as 1 to 2 1/2.

The 154-ton engine of the Great Northern produces an end reaction while it is over one-half of a turntable of 70,000 lbs. maximum per girder. An ordinary consolidation engine, weighing, with loaded tender, 106 tons, will produce an end reaction of 46,000 lbs. maximum per girder. These loads are three and two times as great respectively as the maximum load upon a locomotive driver, and are far greater than can safely be put upon the trailing wheels of a turntable, no matter what their construction. It must, in this connection, be remem-

bered that each engine wheel, in rolling upon the table, drops down upon it about one inch, and exerts a heavy blow in so doing. From these premises, the conclusion was reached that modern turntables should be constructed without trailing wheels. Having adopted this type of table, it was found that important advantages would result therefrom. It became impossible to use

trailing wheels, acting with so large a leverage upon an imperfect track, would make it very difficult to turn the table. From an investigation made by figuring the center of gravity for locomotives, both with empty tender and with loaded tender, it has been found that all locomotives of usual weight and proportions can be accurately centered upon a turntable of 60 ft. length. But if provision is to be

made for accommodating the largest locomotives, it is desirable to adopt a greater length for new turntables, and 65 to 66 ft. has now become the standard on certain leading railroads. A 65-ft. table would be required for the 154-ton mastodon locomotive of the Great Northern, and on many roads it is desired to use a table not only for turning locomotives, but also for turning certain passenger cars,

which is a further argument in favor of the longer table.

New Class "G" Locomotives for the Wabash.

In a recent issue the new passenger and freight locomotives for the Grand Trunk Railway were illustrated and attention was called to the fact that all the important parts were interchangeable, for both classes of engines, and this feature has been carried out even more fully in the new class "G" locomotives, designed for the Wabash Railroad by Mr. J. B. Barnes, Superintendent of Motive Power and Machinery. From these designs the Baldwin Locomotive Works is building five passenger and five simple freight engines, the Pittsburgh Locomotive Works five simple freight engines, while the Richmond Locomotive Works is building five simple and five two-cylinder, compound freight locomotives. The first deliveries were made about March 1.

Fig. 1 shows an elevation of one of the passenger engines, which are of the Atlantic type, while Fig. 2 gives the details of the boiler for the freight locomotives, which are of the ten-wheel type. The five compound locomotives are similar in all respects to the simple freight engines, excepting in the matter of cylinders; 20 1/2 and 32 in. x 26 in. cylinders are used for the compounds, while all the simple engines, both passenger and freight, have cylinders 19 in. x 26 in.

The passenger and freight engines have the same total weight, and total wheel base, the same over-all dimensions, and the spacing of the wheels is the same for all. The driving wheels of the freight engines

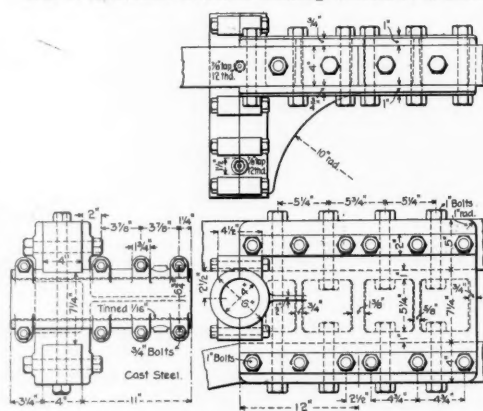


Fig. 3.—Rocker Box and Frame Splice—Wabash Locomotives

sary to place the locomotive so that its center of gravity will approximately be over the center. This, however, is in reality necessary for any turntable, inasmuch as the friction arising from a load on the

are 63 in. in diameter, while 73 in. drivers are used for the passenger locomotives. On account of the larger driving wheels, the center line of the boilers of the passenger engines is 8 ft. 7 in. above the top of the rail, or 5 in. higher than the center line of the freight engine boilers; and as the same size boilers and stacks are used for both engines, the top of the stack of the passenger engines is 15 ft. above the top of the rail, or 5 in. higher than the stacks of the freight engines. Substituting a pair of trailing wheels for the rear drivers of the ten-wheel engines allows the fireboxes of the passenger engines to be made the same depth at the back as in front, resulting in a slightly larger firebox heating surface; sloping fireboxes wholly above the frames are used with the freight locomotives. The introduction of the trailing wheels also alters slightly the construction of the frames at the rear ends, but in other regards the frames are of the same design and dimensions for both the passenger and freight engines. The arrangement of the frame splice and rocker box is shown by Fig. 3.

The boilers are of the extended wagon top type, and carry a working steam pressure of 200 lbs. per sq. in.; the same size boiler is used for all these engines. Radial stays are used, excepting in the first four rows, where the crown sheet is supported by means of two heavy tee irons carried by sling stays from the roof of the wagon top. The cabs are the standard of the Wabash Railroad, and all the small parts of the operating machinery are common to all the engines.

The following list of dimensions shows quite clearly wherein the Atlantic type and ten-wheel locomotives differ, and except as indicated the dimensions of the freight and passenger engines are the same:

General Dimensions of Wabash Class "G" Locomotives.

Type.....	Frt., Ten-wheel; Pass., Atlantic
Name or number.....	Frt., 701-715 inc.; Pass., 601-605 inc.
Name of builder.....	Frt., Baldwin L. W.; Pittsburgh L. W.; Richmond L. W.; Pass., Baldwin.
Gage.....	4 ft. 8½ in.
Simple or compound.....	Frt., Both; Pass., Simple
Kind of fuel to be used.....	Bituminous coal
Weight on drivers.....	Frt., 108,000; Pass., 83,000 lbs.
" truck wheels.....	29,000; " 30,000 lbs.
" trailing ".....	" —; " 24,000 lbs.
" total.....	137,000 lbs.
" tender loaded.....	90,000 lbs.
General Dimensions.	
Wheel base, total, of engine.....	24 ft. 5½ in.
" driving.....	Frt., 14 ft. 0 in.; Pass., 7 ft. 0 in.
" total (engine and tender).....	49 ft. 3½ in.
Length over all, engine.....	36 ft. 11½ in.
" total, engine and tender.....	59 ft. ¾ in.
Height, center of boiler above rails—	
" of stack, above rails—	Frt., 8 ft. 2 in.; Pass., 8 ft. 7 in.
" of stack, above rails—	Frt., 14 ft. 7 in.; Pass., 15 ft. 0 in.
Heating surface, firebox.....	Frt., 186.16; Pass., 200.04 sq. ft.
" tubes.....	2,223.27 sq. ft.
" total.....	Frt., 2,409.43; Pass., 2,423.31 sq. ft.
Grate area.....	29.92 sq. ft.
Wheels and Journals.	
Drivers, number.....	Frt., 6; Pass., 4
" diameter.....	Frt., 63 in.; Pass., 73 in.
" material of centers—	
" Frt., Cast iron; Pass., Cast steel	
Truck wheels, diameter.....	Frt., 30 in.; Pass., 33 in.
Journals, driving axle, size.....	8 in. x 9 in.
" truck.....	5 in. x 9 in.
Main crank pin, diameter.....	6 in.
Cylinders.	
Cylinders, diameter.....	Frt., 19, 20½ and 32 in.; Pass., 19 in.
Piston, stroke.....	26 in.
" rod, diameter.....	3½ in.
Kind of piston rod packing.....	Wabash metallic
Main rod, length, center to center.....	10 ft. 0 in.
Steam ports, length.....	19 in.
" width.....	1¾ in.
Exhaust ports, length.....	19 in.
" width.....	1¾ in.
Bridge, width.....	1½ in.
Valves.	
Valves, kind of.....	Wabash balanced
" greatest travel.....	6 in.
" outside lap.....	1½ in.
" inside lap.....	Frt., line and line; Pass., 1 in.
" lead in full gear.....	1 in.
Boiler.	
Boiler, type of.....	Extended wagon top
" working steam pressure.....	200 lbs.
" material in barrel.....	Frt., Carnegie steel, Illinois steel, Otis steel; Pass., Illinois steel.
" thickness of material in barrel.....	5½ in.
" diameter of barrel.....	66 in.
Seams, kind of horizontal.....	Quadruple riveted
" circumferential.....	Double riveted
Thickness of tube sheets.....	5 in.
" crown sheet.....	¾ in.
Crown sheet stayed with.....	Radial stays
Dome, diameter.....	31 in.
Firebox.	
Firebox, length.....	8 ft. 5½ in.
" width.....	3 ft. 6¼ in.
" depth front.....	74½ in.
" back.....	Frt., 64 in.; Pass., 74½ in.
" material.....	Frt., Carnegie steel, Illinois steel, Otis steel; Pass., Illinois steel.
" thickness of sheets.....	¾ in.
" brick arch.....	Yes
" water space, width—Front, 4 in.; sides, 3½ in.; back, 4 in.	
Grate, kind of.....	Wabash standard
Tubes.	
Tubes, number.....	300
" material.....	Charcoal iron
" outside diameter.....	2 in.
" length over sheets.....	14 ft. 3 in.
Smokebox.	
Smokebox, diameter, inside.....	62¼ in.
" length.....	59 in.
Other Parts.	
Exhaust nozzle.....	Single
" diameter.....	Frt., 4½ in.; Pass., 4 in.
" distance of tip below center of boiler.....	1½ in.
Netting.....	Wire
" size of mesh.....	2½ x 2½ in.
Stack.....	Taper
" least diameter.....	13 in.
" greatest diameter.....	17 in.
" height above smokebox.....	3 ft. 10 in.

Type.....	Swivel trucks
Tank capacity for water.....	4,500 gals.
Coal capacity.....	10 tons
Kind of material in tank.....	Steel
Thickness of tank sheets.....	¼ in.
Type of under-frame.....	Steel
Type of truck.....	Diamond frame
Truck with rigid bolster.....	
Type of truck spring.....	Double elliptic
Diameter of truck wheels.....	Frt., 33 in.; Pass., 36 in.
Diameter and length of axle journals.....	4½ x 8 in.
Distance between centers of journals.....	6 ft. 3 in.
Diameter of wheel fit on axle.....	5½ in.
Diameter of center of axle.....	4½ in.

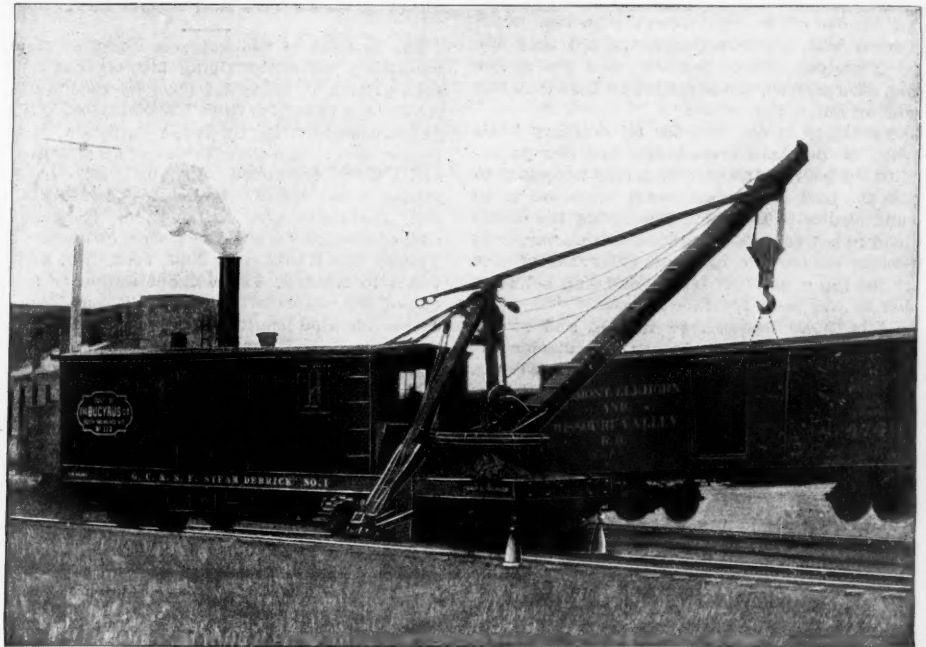


Fig. 1.—35-Ton Steam Wrecking Crane—Atchison, Topeka & Santa Fe.

Type of truck bolster.....	Cast steel
Type of truck transom.....	Steel channels
Length of tender frame over bumpers.....	22 ft. 1¼ in.
Length of tank.....	19 ft. 6 in.
Width of tank.....	9 ft. 6 in.
Height of tank, not including collar.....	4 ft. 1¼ in.
Height of tank over collar.....	5 ft. 7½ in.
Type of back drawhead.....	Gould
Without water scoop.....	

Names of Makers of Special Equipment.

Wheel centers.....	Pass., Standard Steel Co.
Tires.....	Frt., Standard, Latrobe, Midvale; Pass., Krupp, Standard
Sight-feed lubricators.....	Detroit Lubricator Co.
Bell ringer.....	Wabash R. R.
Front and back couplers.....	Gould Coupler Co.
Safety valve.....	Wabash R. R.
Sanding devices.....	H. L. Leach
Injector.....	Frt., Nathan Mfg. Co., Ohio Injector Co.; Pass., Ohio Injector Co.
Driver brake equipment.....	American Brake Co.
Tender brake equipment.....	Westinghouse Air Brake Co.
Tender brake beam.....	Marden
Tender brake shoe.....	Wabash R. R.
Driver brake shoe.....	Sargent Co.
Air pump.....	Westinghouse Air Brake Co.
Air pump governor.....	"
Steam gages.....	Crosby Steam Gage & Valve Co.
Engine truck springs.....	Chas. Scott Spring Co.
Driving springs.....	"
Tender springs.....	"
Piston rod packings.....	Wabash R. R.
Valve.....	"

Steam Wrecking Crane for the Atchison, Topeka & Santa Fe.

The Atchison, Topeka & Santa Fe has recently received a heavy steam wrecking crane of 35 tons capacity, designed and built for severe emergency service by the Bucyrus Company, of South Milwaukee, Wis. Figs. 1 and 2 show the general fea-

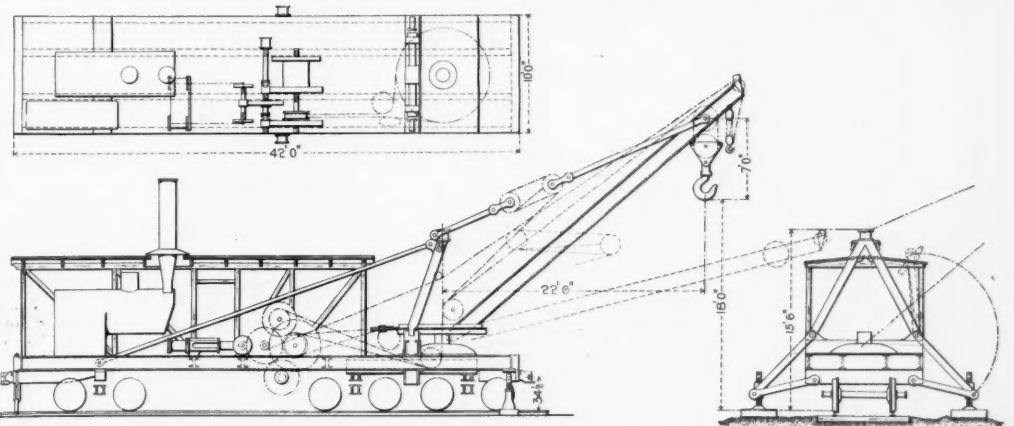


Fig. 2.—35-Ton Steam Wrecking Crane.

tures of this machine, which has a total weight in working order of 136,000 lbs. The crane is mounted on the forward end of a steel car 42 ft. long by 10 ft. wide, while the engines, boiler and the greater part of the operating machinery are placed within the inclosed space.

The crane proper is of structural steel on the lines of an elementary derrick with a simple pin connected "A" frame, back guys and a straight boom, so that all stresses are provided for in a direct manner.

The clear height from the rail to the top of the "A" frame is 15 ft. 6 in. when the boom is lowered.

The boom is 33 ft. long built up of two 15 in. steel channels with top and bottom plates, so as to form a box girder. The boom guys and back guys are of solid forged steel of such sectional area that they will never be subjected to a greater stress than 12,000 lbs. per sq. in. The boom has a vertical clearance of 18 ft., being sufficient to lift a box car and place it on a flat car alongside the crane. The straight

boom as used with this crane presents an advantage over curved forms in that a greater head room is provided for the blocks, while giving the same vertical clearance.

For the purpose of lowering the boom into position for hauling the car over the road the front guys are formed with a rear extension, so that they may be pin-connected to the "A" frame in either of two positions. The raising and lowering of the boom is done by power by means of a snatch block attached to the "A" frame for that purpose and the guys are carried during the operation by lugs suitably formed on the head of the frame.

The main hoist consists of 1 in. diameter crucible steel wire rope running over turned sheaves 24 in. in diameter. The hook is of steel, has an opening 10 in. in diameter and a capacity of 40 tons; the rope is of sufficient length to allow the hook to reach the rail and hoist to a clear height of 18 ft. The radius of the swing is 22 ft. 6 in., the angle of swing is 180 deg., and the lifting speed of the main hoist is 10 ft. per minute. The swing motion is obtained by means of two crucible steel wire ropes, 1 in. in diameter, wrapped around a swinging circle of large diameter and carried to a drum which is provided with a suitable brake. This mechanism is sufficiently powerful to swing the load against the force of gravity when the machine is not on level track, while the brake has sufficient capacity to hold the boom in position while it is hoisted or lowered.

An auxiliary hoist, shown in Fig. 2, is provided for handling light loads at a rapid speed, which hoist has

a reach of 75 ft. from the point of the boom, and is operated by means of a 1½ in. diameter manila rope. Two removable winch heads fitted to the cross shaft beneath the car are provided for general hauling and warping purposes.

To obtain the necessary stability when lifting side loads, and also for taking the weight of the load off the forward trucks, two steel jack-arms are provided and hinged to the base of the "A" frame in such a manner that they may be folded up against

it when not in use; a small block and tackle operated by the engines is provided and attached to the car frame for raising and lowering the jack arms. These arms are pin-connected to the top and bottom members of the transverse truss over the forward truck center so that they form a continuation of the truss, the jack screws relieving the car body of the excess load. The jacks are placed 19 ft. center to center and have screws of hammered steel $\frac{3}{4}$ in. diameter. Two additional jacks are provided under the front of the car and are hinged so that they can be hung up out of the way when not in use. Four rail clamps with screw adjustments are used for anchoring the car, two at the front and two at the rear end. These, also, are arranged so that they can be hung up when not in use.

Ample stability is obtained for all ordinary loads by means of the jack screws and rail clamps attached to the body of the car. It is only necessary to let down the jack-arms when heavy loads are to be lifted and swung to the side. For lifting the maximum load in extreme side positions it is necessary to still further anchor the machine by means of side guys to the top of the "A" frame, and ring bolts are provided in the head for this purpose.

A load of 70,000 lbs. can be hoisted and swung through an arc of 100 deg. when the machine is standing on the jack arms and through 180 deg. when the side guys to the top of the "A" frame are in place, or, 40,000 lbs. can be swung through 180 deg. when standing on the jack arms without side guys.

The boiler is of the locomotive type 45 in. in diameter at the barrel by 10 ft. long, and is designed to carry a working steam pressure of 100 lbs. per sq. in.; the tank has a capacity for 600 gallons of water.

a 16-deg. curve. The load on each journal is 11,333 lbs., or equivalent to a load per sq. in. of bearing surface of 296 lbs.

This machine was designed by Mr. A. W. Robinson, Engineer of the Bucyrus Company, which firm also builds machines of 20-ton capacity similar to the one illustrated, which have vertical boilers, 8x10 in. double engines, and the same length boom and swing as the 35-ton crane.

New York Anti-Scalper Law.

The decision of the Supreme Court of New York sustaining the anti-scalping law of that state has been printed in pamphlet form by the "Anti-Scalping Bureau of Information," Washington, D. C. This decision was written by Judge Patterson, of the Supreme Court, Appellate Division, First Department, and was concurred in by all the other judges who heard the case—Van Brunt, Barrett, Ingraham and McLoughlin. It was in the suit of George Tyroler for a writ of habeas corpus. Tyroler was a broker in New York City, and sold a ticket to Norfolk, Va., without authority from any one of the railroads interested. The decision quotes at considerable length the law on the subject which was passed last year. (Railroad Gazette, May 28, p. 375.) We quote the essential parts of the decision.

It will scarcely be questioned that it is within the power of the Legislature of the state to pass laws to prevent, within its territory, the commission of frauds upon passengers; and it cannot be denied that the particular provisions of the chapter referred to are directed and tend to that end. . . . There is nothing in this statute which deprives this appellant of any right he held in common with the other citizens of the state, or of his property. The buying and selling railroad tickets is nothing but the

ticket; nor does it impair the obligation of a contract, for the ticket is not the contract of carriage. It does not prevent the giving away of a ticket, and if the carrier sells more than one ticket to one person, it directly contracts to furnish transportation to as many people selected by the purchaser as there are tickets sold to him. But special provision is made to protect the passenger in his right. If he does not wish to use the transportation he may have his ticket redeemed. . . . There is no discrimination against any class of citizens. Tickets can only be sold by individuals acting as the agents of the corporations or other carriers, and it is no discrimination causing an unequal operation of the law for the corporate body to select the persons who shall act as its agents, or the unincorporated carriers, its servants. There is no monopoly in the business of selling tickets accorded by that feature of the act. Upon the several matters thus far considered, respecting constitutional objections to the act in question, we have nothing more than has been said above to add to the reasoning in the cases of *Burdick v. The People* (149 Ill., 600); the *State v. Corbett* (57 Minn., 345), and *Commonwealth v. Wilson* (14 Phil., 384); and it would be a mere parade of learning to refer particularly to the authorities cited and considered by the learned Judges who wrote the opinions of the Courts in those cases.

But it is objected that the legislation now under consideration invades the power of Congress to control interstate commerce. The question involved is whether the legislation of the state of New York that we have been considering constitutes a "regulation" of interstate commerce. In the first place, it is to be observed that it does not in any way affect the fact of transportation; it does not in any way hinder or obstruct or trammel a passenger seeking to make a contract of transportation with any carrier. It is merely, in the relation now under consideration, a statute designating and defining, as a police regulation operating within the state of New York, the persons with whom and the places at which arrangements for transportation shall be made. Why is this done? For the security and protection of persons seeking transportation by common

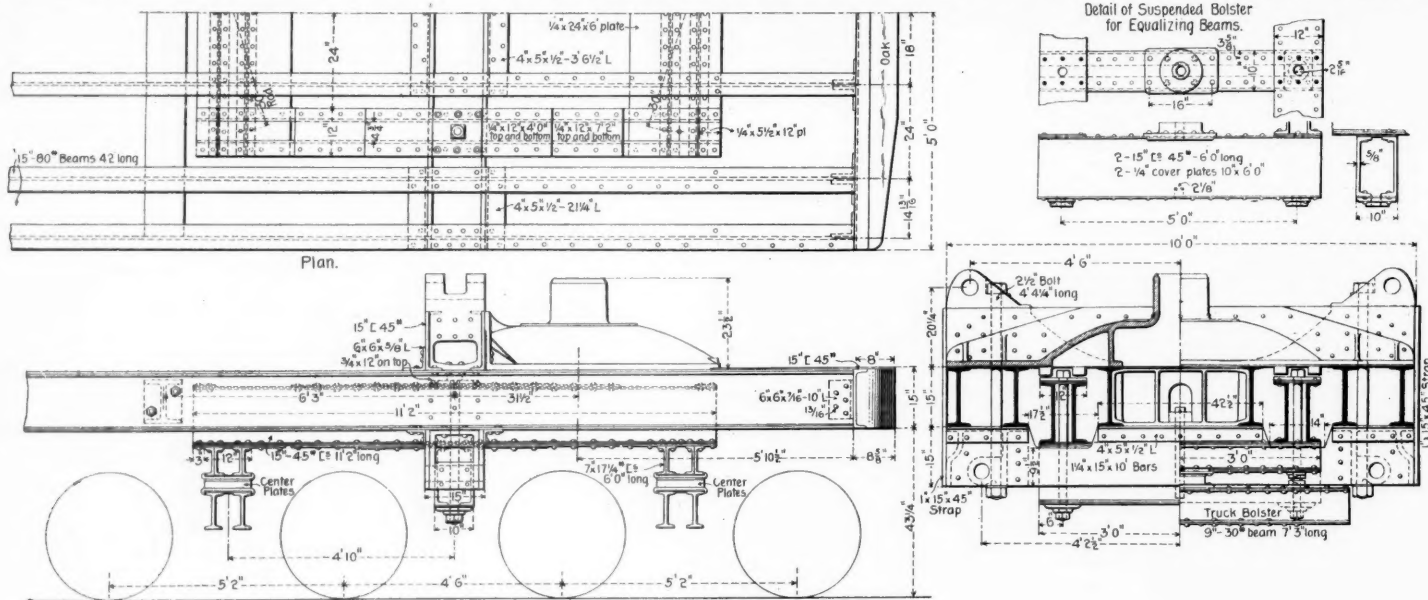


Fig. 3.—Front End Details 35-Ton Wrecking Crane.

Double reversing engines are used, having cylinders 8 in. in diameter by 12 in. stroke; all gearing is of cast steel.

Fig. 3 shows the details of the double truck under the front end of the car and also the construction of the car underframe, which is built up of six longitudinal steel sills of I section, weighing 80 lbs. per ft., while 15 in. 45 lbs. steel channels form the end sills; steel castings are used between the longitudinal sills.

As shown a steel casting forms a bridge piece between the center sills and also has the upper center bearing cast on its lower face. The lower center plate is carried by a transom 6 ft. long and 15 in. deep rigidly connected at either end to the undersides of heavy longitudinal equalizing beams between the car sills; the equalizers are built up of 15 in. 45 lbs. steel channels and top and bottom plates. The short suspended transom is placed between two $1\frac{1}{4}$ x15 in. transverse bars which form a connection between the lower tension bars of the jack arms, filling pieces being used between these plates at either end. There is no flexibility between the equalizing beams and the suspended bolster, but the equalizers are free to rock on the main center bearings. The equalizer beams are cross-connected by four 7 in., 17 $\frac{1}{2}$ lbs. steel channels at either end, which channels transmit the load through cast steel center plates to the truck bolsters of the first and second trucks respectively; the truck bolsters consist of two 9 in., 30 lbs., steel I beams placed side by side. The truck frames are of the usual diamond type with arch bars $1\frac{1}{2}$ x4 in. M. C. B. standard 80,000 lbs. capacity axles with McKee-Fuller 33 in. steel tired wheels and McCord journal boxes are used. The car is also equipped with Westinghouse quick-action brakes on eight wheels, Sargent brake shoes, National Hollow brake beams and Trojan couplers. A single diamond frame truck is used under the rear end of the car, and the trucks have sufficient flexibility to permit the car to pass around

buying and selling of the evidence which entitles a person to transportation by a public carrier. The issuing of tickets is a feature of the carrier's business. The regulation and control of the business of a public carrier is originally with the sovereign power conferring the franchise upon that carrier. If the exercise of that power of regulation and control prevents a third party from securing a personal advantage, which he calls his business, he is not deprived of any constitutional right. The effect of the provisions of the act now in question is to confine the conduct of the business of common carriers in the state of New York to those carriers themselves, so far as the emission and sale and transfer by sale of tickets for transportation are concerned. Railroad tickets being merely the evidences of a contract between the carrier and a passenger, the whole relation as to their issuance and use by this law is limited to the carrier and the passenger. If, as a consequence of this regulation, some person who has heretofore carried on the industry of buying and selling, or speculating in tickets, is prevented from continuing to do so, he is not deprived in any legal sense of his property right in a business. He was merely engaged in doing something, not unlawful in itself, but which might be made so by the exercise of the power the state has to regulate the business of carriers within its boundaries. He had carried on a dealing in respect of which no legislative regulation had been made before this act was passed, but by doing so he did not acquire a vested right as against the state to prevent its exercise of sovereignty in the control and regulation of the incidents of a traffic, to prevent frauds that might be perpetrated through and by means of that very kind of dealing which he had carried on. If the regulation, which the Legislature is competent to make, acts incidentally upon him, it does not deprive him of a general right he had; for, as has been said, the law is directed to the correction, by future prevention, of what the Legislature deemed to be a public evil. The statute is not one preventing a citizen from dealing in merchandise or property generally. Indeed, it has been said that the ticket is the property of the carrier; that it is to be delivered to a passenger to be held temporarily for a special purpose.

The statute does not infringe any of the provisions of the Constitution of the United States with reference to the deprivation of a person of his liberty or property without due process of law. This act does not deprive a person purchasing a railroad ticket from a carrier of his special property in that

carriers within the state, and that such persons may not be imposed upon. . . . The utmost that can be said with reference to the statute, as affecting commerce between the states, is that it includes the sale of tickets for transportation, such as those sold by this appellant. Nevertheless, it seems to be indisputable that the general object of the statute is to enforce a mere police regulation, and that it is purely a local state matter.

The New York Law Journal of March 1, in an editorial on this decision, calls attention to the fact that it is in line with that of the Supreme Court of Minnesota in *State v. Corbett* (57 Minn., 345), and also notes that the decision of the Supreme Court of the United States, in *Henington v. Georgia* (163 U. S., 299) affords strong presumptive support of the New York decision. In the Georgia case the Supreme Court upheld a statute of that state forbidding the running of freight trains on Sunday, notwithstanding the fact that this restriction affects interstate commerce to a limited degree. It was held not to be a "regulation" of interstate commerce, but a legitimate state police regulation, to be respected in the Federal courts until Congress should take action affecting it.

Operating Trains without Air-Brake Angle Cocks

The Michigan Central has had considerable trouble from closed air brake angle cocks, rendering the brakes inoperative on all cars back of the closed cock. It has been found in almost all such cases that the cocks have been closed either maliciously or carelessly, or that they were not opened by the trainmen when coupling up. For these reasons devices for locking the angle cock in the open position are of little value. Mr. E. D. Bronner, Assistant Superintendent of Motive Power, at the February meeting of the Western Railway Club, described the experience of the Michigan Central in running trains on which the angle cocks had been removed entirely. The following is taken from Mr. Bronner's remarks.

Our ideal of the safe train pipe connection through a train is one where there are no angle cocks. As a start toward this condition we removed the angle cocks from all our engines about three years ago, and have experienced no difficulty from such change. In the way of experiment we removed all the angle cocks from a passenger train, consisting of an engine and three cars, and ran it successfully on one of our divisions for two years. It insured the engineer always having air connection throughout the length of his train. To do away with these cocks our Superintendent of Air Brakes devised a dummy coupling, similar to the ordinary Westinghouse coupling, but with a plane face to make an airtight joint with the gasket in the Westinghouse coupling. These dummy couplings are attached to the ends of each car or engine in the place of the ordinary hook. Instead of closing communication between the train pipe and atmosphere by means of the angle cock, it is done by coupling the Westinghouse coupling with the dummy. We never expect to be able to run freight trains without angle cocks, and of course cannot make flying switches without angle cocks on passenger cars, but we do think that we can run any passenger train on the Michigan Central without an angle cock with no greater delay than usual. We find that in coupling up trains we have no difficulty in releasing the brakes of any ordinary train up to about fifteen cars.

Mr. S. J. Kidder, of the Westinghouse Air Brake Company, stated that the chief objection to operating trains without angle cocks was that, while it might be practicable for passenger trains in certain instances, it could not be done in freight service, and that any device used in connection with the air brake necessarily should be uniform and capable of being used under all conditions of service.

Government Control of Railroads.

Prof. Arthur T. Hadley of Yale University was asked by the St. Louis Railway Club to contribute to the topical discussion as to the advisability of placing the control of railroads in the hands of the Government, and the following is taken from his discussion:

State ownership and management of railroads is largely a question of facts and I doubt if any general answer can be given to the question, as it depends on the state and the railroad. The undertaking is more apt to succeed, has more chances of success, in the case of street railroads, which are comparatively simple in administration.

The general lines of argument on the subject are as a rule irrelevant. For instance, the report of the Italian commission to inquire into the subject said that, because the percentage of operating expenses to receipts is less in the case of railroads operated by private corporations than those owned by the Government, public ownership is a bad thing. As a matter of fact, statistics on percentage of operating expenses to receipts are worthless for purposes of comparison. That percentage may be lowered either by economy of administration, a good thing; or increased by tariff charges, a bad thing. Again, comparative charges are worthless, because of different conditions of distance, promptitude and efficiency of service. It is also useless to compare either freight rates or passenger rates separately. This country is one of comparatively high passenger rates, but of incomparably low freight rates.

Low passenger rates do not necessarily mean good conditions. Dresden and Breslau, the two largest cities of Prussia, comparable in size and distance from one another to New York and Boston, have a much inferior train service. There is one train a day that makes the 200 miles in five and a half hours, two regular expresses that cover the road in seven hours, while the regular trains consume twelve or thirteen hours. The fast service commands a fancy price. The lowness or highness of fares does not depend on ownership, public or private, but on the size of a day's wages. If a man earns 50 cents a day he will wait half a day to save 25 cents; if he earns \$5 a day he will pay \$2.50 to avoid waiting half a day.

Railroad abuses divide into two classes—those financial in the administration department, and those of the traffic department. As regards the first class, neither system of ownership has any marked advantage. The cost of duplication is not a fair test of what the original cost should be. Something must be charged up to experience. The capitalization of American railroads, counting all the water in the stock, is about \$50,000 per mile of road. It is estimated at \$60,000, but that is due to the statistical fallacy of counting the stock of railroads held in their own treasuries. As to the traffic abuses, the greater one in this country is discrimination in classes of freight, and especially in favor of individual shippers. This latter is the most serious charge brought against the American railroad system. It is true that the state roads of Germany were also guilty, but when competition ceased the evil was abated. A monopoly feels itself strong enough to make the same rate to everybody. There is some doubt as to whether this abuse is entirely done away with in Germany. Fully one-half the

business of the German roads is done at less than tariff rates. It is a discrimination in rates on different commodities, not personal discrimination, but the German tariff system is none the less a pretense. I doubt the foundation of the claim that private ownership makes higher or lower rates. Comparative figures are secured under such differing conditions as to be worthless.

As to extortion, we have not sufficient facts for statistical basis. What then have we? Efficiency. Here I think the advocates of private ownership have all the best of the argument.

As to quality of service, in the United States the railroads run a train thirteen miles annually for every man, woman and child. In England the figure is eight, in Germany four or five, in Belgium three and one-half. It cannot be said that the sparseness of population is the reason, for it is the service in the densely populated East that brings up the service figures. The point may be made that it is because this country and England are the richest countries, but this leads the advocate of state ownership to admit that his plan is for a poor man's country. In Australia, where public ownership and control is absolute, where the roads are operated by the same race as our own, they have not yet run trains at a speed equal to eight hours' time between New York and Boston. This affords, it seems to me, a reliable indication of the probable efficiency of state-owned railroads. On the other hand, there is in England and this country an undeniably greater percentage of accident.

In the promise of development in the future, we find much greater weight of argument on the side of the advocates of private ownership. All improvement results from private enterprise. About ten years after private railroad enterprise has established improvement in this country or England, the Government railroads on the continent began to find it out. Invention and initiative is not stimulated, but deadened by Government control.

T 13 Average Life of a Railroad Trainman.

It has been estimated, and I have heard railroad men say that the average life of a man actively engaged in train service is about seven years; in other words, they would be either crippled so as to render them unfit for service or killed. It has been found by looking over the records of one of the leading railroads entering Louisville, Ky., that this old saying is untrue; during three years on one of the busiest roads entering the above city there were only two killed and 158 injured, all of whom were brakemen except two, and they were freight conductors, who had attempted to assume the duty of brakemen by making a coupling, and the other by assisting in unloading freight and sprained his back.

It would seem that inexperienced men would be the most apt to get injured, but the figures show differently, as indicated by the following: There were 11, or 9.56 per cent. of the total number of trainmen injured during their first year of service; 18, or 12.16 per cent. injured who had been in the service two years; 15 or 11.11 per cent. in service three years; 22, or 16.35 per cent. four years; 27, or 20 per cent. five years service; 27, or 21.77 per cent. six years; 13, or 9.63 per cent. seven years; 5, or 3.90 per cent. eight years; 3, or 2.47 per cent. nine years; 5, or 4.16 per cent. 10 years, and 12, or 8.89 per cent. who had been in the service over 10 years, some of whom had been in the service 15, 18 and 22 years.

It will be noted that the largest average of injuries occurred after the employee had been in service six years, and the figures given would indicate that employees as a general rule are careful up to the time when they have been in the service three to four years, and then become more careless until about their eighth year of service, when the indications show that they again become careful, as those who had worked over 10 years have a very small comparative per cent. of injuries compared with those who had worked six years.

With the winding up of the equipping of all box cars with the Janney or automatic couplers, air brakes, etc., the liability of a trainman being injured will have been reduced to a minimum, as the record goes to show that at least two-thirds of those injured was caused by attempting to couple automatic draw bars with a link and pin to the old fashion, solid or skeleton draw bar, which is very dangerous even to the most experienced railroad man. Other causes were on account of uneven draw bars, some being as much as three inches in difference in height. This will be rectified with the new law which requires all draw bars to be of a standard height. A great many were injured by stepping on stones, or a link, in jumping off to throw switches, etc.; quite a number on account of being jerked off on account of the icy condition of the tops of the cars, as when they began sliding, there was nothing to stop them. These causes will exist as long as it is necessary for the trainmen to get out on top of the cars. There was one case where a brakeman was standing near the end of a car when another cut off car struck it and he was thrown from the

top of the car to the ground, alighting squarely on his feet, and stoving him up severely, as will be readily understood. Some few were compelled to jump from the top of a car on account of its jumping the track, with indications of its going to turn over. Others had their feet smashed by attempting to shove an automatic draw bar over a few inches to enable it to come more squarely in contact with the other automatic coupler which it was intended to couple to. This is one of the serious objections to the automatic draw bar, that it will not couple readily on a curve, and it is necessary for the trainmen to either take their hands and pull one of the draw bars over, or shove it over with their foot, which might result in an injury as above stated.

About one of the most general causes of pinched fingers was on account of the pin failing to drop all the way down into the hole when coupling with a link and pin. A man reaches over to give the pin a start so it will drop into the hole, when the cars will generally roll one way or the other just a few inches and catch the pin before he gets it all the way down, causing it to tilt back and catch his fingers between the pin and end sill of the car.

Some few were injured by holding on to the grab iron on the end of car (recently added to all freight cars by an act of Congress) and attempting to make the coupling when long lumber or bridge iron would be extending over the end of the car to be coupled to, and catch their hands between the timber and end of car. This dangerous method of coupling cars together that have lading projecting over the ends of them will soon be a thing of the past, as it is becoming a general rule for all companies to not permit the loading of cars in this manner; whenever there is long timber to load the companies require the use of two cars instead of one as heretofore.

Louisville, Ky.

J. G.

Steel Forgings for Locomotives.

In discussing the use of steel for axles, crank pins and piston rods at the February meeting of the Western Railway Club, several members gave their experience with this material.

Mr. Robert Miller, Superintendent of Motive Power and Equipment, Michigan Central, said: "We are now using a great many steel axles made by the Coffin toughening process, also crank pins and piston rods. We have crank pins break occasionally, but very seldom. I believe that everyone must recognize the fact that the cost of steel is so much below that of good wrought iron that we cannot afford to use the latter. Also that we cannot afford to use wrought iron, because of the superiority of steel over iron. We have just completed one thousand freight cars of 60,000 lbs. capacity, under which steel axles were used. The best wrought iron axles that we could get did not prove satisfactory; they were not closely welded, developed seams and we were troubled with hot boxes, while the axles would break as easily as the first steel axles manufactured. In a test at one of our shops we came across some steel axles. Under the same tests that broke our own wrought iron axles in six blows of the hammer, we pounded a steel axle without producing a fracture until we got tired and gave it up. So I believe that in using steel for axles, piston rods and crank pins we are going in the right direction. We have not used any of the nickel steel, but I am favorably impressed with the claims made for that."

Mr. J. B. Barnes, Superintendent of Motive Power and Machinery, Wabash, said: "We are now using nickel steel for crank pins and have been doing so for several months, and so far have found it an excellent material for this purpose and very satisfactory. I would further say that I think nickel steel for crank pins, piston rods and stay bolts is the coming material without any doubt. We are now practically testing this material for stay bolts in fire-boxes, but as yet it is too early to give definite results as to our experience in this direction, as it will, no doubt, take several months for us to come to a conclusion."

Mr. Peter H. Peck, Master Mechanic, Chicago & Western Indiana, said: "I find steel axles work very well. I have had them under all of our tenders for 10 years, and also have used steel for locomotive driving axles, piston rods and crank pins. I have taken no notice of steel axles under cars running over our road, because we keep the cars but a short time. There have been but two breakages of steel piston rods in 10 years, and but one rod broke in 8 years, which breakage occurred only a few days ago. I have had but one broken steel crank pin, while none of the steel axles have broken. I like the steel forgings better than those of iron."

The Italian Mediterranean Railroad Company has ordered 60 freight cars of the American plan, with capacity for 30 tons of load. Both this and the Southern Company are preparing to build American passenger cars, or at least the European imitations of them, for the through service between North Italy and Rome.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

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There was a time when the number of freight cars owned by a railroad was a sufficient measure of its freight car capacity; for such cars were almost uniformly built to carry ten tons. The increase in capacity of such cars began to be general about 20 years ago and has continued ever since; with the result that most railroads have cars of several different sizes, and consequently the number of cars no longer indicates the capacity. Nevertheless, most companies report nothing but the number. The Illinois Central, however, reports both the number and the aggregate capacity of its freight cars, and as in its last report it gives these figures for every year since 1883, we are able to trace the fluctuations in the average capacity of its cars. This average Jan. 1, 1884, was 28,797 lbs., reached 30,010 lbs. in 1887, 35,000 lbs. in 1890, 42,605 lbs. in 1893, and 48,847 lbs. in 1897. The stock of freight cars increased from 8,000 in 1884 to 22,714 in 1897, or 184 per cent.; but the aggregate capacity of its freight cars increased meanwhile from 115,189 tons to 554,755 tons, or 382 per cent. Thus the capacity has increased more than twice as much as is indicated by the number of cars. Yet the number of cars is all that most companies report. The Illinois Central in the same report also gives the average hauling capacity of its locomotives, but only for the two years, 1889 and 1897, within which period it increased from 2,071 to 2,557 tons, or 23½ per cent. The number of engines increased 55½ per cent., but their aggregate capacity for hauling loads increased 92 per cent.

The acquisition of the Swiss railroads by the State (reported in these columns Feb. 25 and March 18) was contemplated by their charters and the terms were fixed in a general way. The State could take them by paying 25 times the average net earnings of the previous ten years, but not less than their cost. In all cases, probably, it remains to be determined what have been the actual net earnings and the actual investment to be made good, and a law was passed two years ago providing for a government accounting especially to establish these facts. The government's estimates were that three of the companies were entitled to the 25 years' purchase, that is, had earned an average profit of more than 4 per cent. a year for the last ten years. But it is estimated that in the purchase reductions for depreciations, etc., from the original cost must be allowed for by the companies, amounting in the aggregate to more than one-sixth of their whole capital. The prices of the Swiss shares on the exchanges show that the government estimate was much less than the investors' estimate of the value of the properties; for the exchange prices only the day before the vote on State purchase was taken would have made the total value of the shares \$74,000,000, for which the State purposed to pay only \$56,000,000. And though the actual price remains to be fixed, and the courts will have to pass on the government's claims, it is evident that the public does not expect

that the companies will be able generally to establish their claims; for the prices after the vote show decreases in all shares, and enormous ones in some, as 20 per cent. in Jura & Simplon shares, 27 per cent. in Union shares; while the roads heretofore profitable suffered less, the decrease in Gotthard shares being 3 per cent.; in Central, 4 per cent. The government estimates were that if the State paid 4 per cent. for the purchase money the roads would just about pay expenses and a small sinking fund for the retirement of the capital; at 3½ per cent. for money there would be a profit of about \$420,000; at 3 per cent., a profit of \$887,000. Although the aggregate capital of the roads is more than \$200,000,000, the State by its estimate will have to raise only \$56,000,000 to make the purchase, as it would take over the present debts of the companies, which represent the larger part of their cost. The effect of the purchase on the interests of the shareholders, as indicated by the exchange prices, is very different from the effect of the Prussian purchases. That gave the stockholders in the aggregate such high prices for their shares that they had every reason to be satisfied.

War and Business.

For a business man about the first thing to be seriously considered when he comes face to face with a possible war is the probable effect of that war on business. At very rare intervals in the history of a nation an emergency comes up when this is the last thing to be considered, or at least the last thing to guide conduct. But such emergencies have happened seldom in all human history, and no such emergency now confronts the people of the United States. The first duty, therefore, of every civilized citizen is to carefully consider the effect of a war with Spain upon the business prosperity of the United States.

Probably it is safe to say at the outset that the first effect would be to injure public and private credit. Securities, public and private, will be less salable in the market, will bring less money when sold, will be less available for loans. The Government would enter the market as a competitor with private borrowers. Some of these influences have already been felt, only on the apprehension of war. Where a few months ago industrial concerns could borrow money in abundance at 3½ per cent. they are now paying 5 per cent., simply because war is threatened. The depreciation in the market value of securities would amount to an assessment of a great many million dollars on the property of our people. As a consequence of all these things business affairs would be hampered by the difficulty of getting cash to carry them on. In general terms, therefore, the result of a war would be interruption to business enterprise of every kind, stopping new projects and diminution of the output of existing businesses and contraction of trade everywhere. This course of things has already begun. Who ventures to-day to engage in a new enterprise? What answer will you get when, having a productive enterprise planned and ready to be prosecuted you ask for capital? "Wait till the war scare is over."

Certain limited industries would profit by a war. Obviously, the makers of small arms and the makers of ammunition will be busy and will get good prices. Indeed, they are busy now. But it is not easy to think of any other class of industries or business that will be stimulated, at least more than in a small way and for a short time. Even the makers of arms are not agreed that a war is desirable for them. We are informed by one of the great concerns making small arms and ammunition that on the whole they would expect to lose more than they would make out of a war between the United States and Spain.

Let us consider the carrying trade by land and sea. Obviously, the sea trade under the American flag will be practically wiped out for the time. Our important coasting trade would be destroyed. We have not a sufficient navy to protect it against even a very inefficient regular or privateering fleet.

As a result of the interruption of the coastwise trade the North and South railroads, particularly those near the Atlantic seaboard, would naturally have increased business, unless the coasting trade is carried under a foreign flag. Obviously, Congress could, and very likely it would, admit foreign countries to this trade. The change could be quickly made, for it would consist chiefly in hoisting the British flag instead of the American over our coasters. These North and South railroads would naturally have also some additional business in moving troops and war supplies. But the number of troops to be moved will be small, and the total amount of war

supplies to be moved will not be great; at least it will be but a trifling percentage of the normal traffic. Therefore, the profit, even to these lines, coming from a strictly military business, would probably not make up for the traffic lost through a general stagnation of industry and trade. In our civil war some of the railroads had a great military traffic, especially the Philadelphia, Wilmington & Baltimore, the Pennsylvania and the Illinois Central; but no such volume of traffic could be poured over any of our lines by any such war as is now possible.

Furthermore, it is doubtful if even during the civil war, (when thousands of millions of capital came from Europe, and was expended in this country to carry on the war, that is, when the nation's future was mortgaged for many years to come) the aggregate amount of transportation was as great as it would have been if there had been no war. It is difficult to see how the railroads throughout the country could get new movement, either freight or passenger, to make up for the loss of movement consequent upon the interruption to normal business. It does not seem likely that the movement of food supplies would be as great after the war began as before. To be sure, the export movement would go out of our ports under foreign flags, and might not be much interrupted. But it is not certain that a foreign flag would protect our ocean trade under the particular circumstances which exist with regard to Spain, and this applies to the coastwise trade, of which we have spoken above, as well as to the transatlantic trade. Spain and the United States did not sign the Paris convention, so that immunity from capture of our goods in foreign ships depends upon treaty, and it is supposable that Spain might denounce that treaty.

The food requirements for the small force put into the field would make little impression on the general movement, and, furthermore, when employment and wages are reduced the movement of food supplies must quickly feel the effect.

At first thought one would say that the great iron and steel industries would be stimulated, for iron and steel are emphatically war materials. But all the iron required for projectiles, for guns and for such small war craft as may be put under immediate construction could be but an insignificant percentage of the great output of the furnaces and the mills. To interrupt the building of, let us say, the new East River bridge, or of a dozen great steel frame buildings, would have more effect on the minus side of the iron market than the military requirements would have on the plus side.

The same reasoning is true, only in greater degree, of all the great industries. The situation would not be comparable with that which existed during the years of our civil war. Then vast armies were in the field. These armies had to be clothed and fed, with the result that the price of wool, leather and all food supplies went up. Furthermore, the number of men withdrawn from useful employments was large enough to make a really serious effect on the labor market, and to put up in some degree the scale of wages. But even with that condition it is, we suppose, a fact that wages did not rise proportionately with the cost of living. It is a further fact that notwithstanding abnormal activity in certain lines there was depression, and almost stagnation, in many other lines, and taking the country over the lot of the poor people was harder than in the years of peace before or after the war.

One aspect of this whole question which presents itself already in an actual concrete way in some localities is uneasiness among workmen, especially machinists—signs of a demand for more wages and shorter hours. The manufacturer seeing this reasons that all persons in like lines of business will have to pay higher wages, and that he can put up his prices, to cover the rise in wages, and can add a percentage of profit on that rise. This source of profit is, we judge, only local in the present case, and not likely to endure even there, for reasons suggested above.

As one comes and goes in the streets he constantly hears expressions something like this: "Oh, a war will make the rich men squeal; it will make those fellows in Wall street bleed; it will make things lively for the poor folks." It is pitiful to think that any great number of our people can be misled for a moment by such phrases. However serious may be the business depression, the rich man, or the people of moderate means, will not actually suffer; they will still have tight roofs over their heads, comfortable beds to sleep in, plenty of good food to eat and fuel to keep them warm. They may often have to cut down certain living expenses.

They may have to take their boys out of preparatory schools and send them to public schools. They may have to take their boys out of college and make them go to work. But these things do not amount to a catastrophe. A considerable percentage of those boys will actually be better off for such a change, and few of them will ever suffer much as a consequence. But interruption of employment, loss of wages, or a serious reduction of wages among the people who have no surplus means actual suffering; it means hunger and cold; and after all, that is where war would pinch just as all hard times pinch. Such facts as these the daily newspapers ought to keep before the people in standing headlines.

A Decade of Federal Railroad Legislation.

This is the title of a paper in the Atlantic Monthly for April, by Prof. Henry C. Adams, Statistician of the Interstate Commerce Commission. Mr. Adams' argument may be epitomized under six heads. He starts out with (1) the statement that merchants, manufacturers and farmers do not need state supervision, but that railroads do need it; because, in transportation, competition does not work out tolerable results, as in other business; it compels railroads to disregard equity as between customers. Railroad transportation is subject to the "law of increasing returns;" it is an extensive and not an intensive industry. (2). The chief aim of the Interstate Commerce law was to stop discrimination. This point Prof. Adams illustrates by citing the possible case of all the railroads out of Chicago combining to give rebates to one live stock shipper, thus killing the business of all other such shippers. We may remark in passing that this is a somewhat unfortunate selection, as every one acquainted with freight matters at Chicago will at once query why, instead of taking this fictitious instance, the writer did not take for his illustration an actual case, the dressed beef shippers combining to give all their business to one railroad.

(3). The framers of the Interstate Commerce law intended that the Commission should be enthusiastically aided by the courts, but the courts have not done this, and that's what's the matter. If the interpretation of the law assumed by Congress had been adopted by the courts the railroad problem would, by this time, "have approached more nearly its final solution" (a commendably cautious conclusion).

(4). The Interstate Commerce Commission has done more good by its unpublished work than by its formal opinions. This has reference, we suppose, to the systematizing of accounts and of tariffs, etc., which has taken place during the past ten years. But the opinions of the Commission are of value; over 800 points have been decided, and this is a body, or at least the nucleus of a body, of law "filling five books, which look down with dignity" from the shelves of every important law office.

(5). As before said, the chief function of the Commission was to execute a criminal law; but it cannot undertake police duty and it can cope with illegal rate making only by making up a body of law; and this body cannot be made except by the process of adjudicating a large number of cases. To do this, however, a large number of complaints must be made; but shippers do not make many complaints because they cannot get conclusive evidence, so that the present need is to make evidence more easily procurable. How shall this be done? The answer is that the Statistical Bureau of the Commission should be made more effective, should gather such a body of facts from the railroad companies that all manner of law breaking could be detected through the usual channels of Government examination of accounts. Prof. Adams says that the Statistical Bureau has, in connection with the Railroad Auditors' Association, done good work, but has not gone far enough.

(6). The essay, which is rather apologetic in tone throughout, ends with a specific apology for the non-effectiveness of the Commission, based on a complaint of three judicial decisions, first, the Counselman case, under which, until 1896, witnesses could not be compelled to testify; second, the Kentucky & Indiana Bridge case, in which the railroads were permitted to nullify the work of the Commission by holding back a part of their evidence; and, third, the Social Circle case, in which the Commission was forbidden to alter rates, except on past transactions. In view of all this the Commission has not yet had a fair chance, and this experiment in state regulation must still be considered as inconclusive; judgment must be suspended.

Advance sheets of Prof. Adams' paper were sent

out by the Atlantic Monthly about two weeks ago to the daily papers, and, ample time being thus given for reading the article, criticisms have been more than usually numerous. Two of these, editorials in the Pittsburgh Dispatch and the Burlington Hawkeye, are quite sharp. We cannot say that these criticisms are all in the right spirit, but they show that the editors are by no means disposed to accept Prof. Adams' arguments without inquiry. The first named paper attacks Prof. Adams on his very first point—that railroads need regulation on a basis different from that which applies to manufacturers. It is pointed out that the law of increasing returns applies in many other large industries. "When the farmer by superior tillage and fertilization increases his crop of wheat from 15 to 35 bushels an acre he brings his business under the law of increasing returns. The merchant can sell \$1,000,000 of merchandise for much less expense per \$1,000 of sales than the merchant who sells but \$100,000 worth. It costs \$500,000 to turn out the first Bessemer steel rail, and nearly \$2,000,000 to completely manufacture the first yard of calico." The Dispatch holds that the true reason why competition does not work satisfactorily in transportation is that it has never been allowed to work completely; all railroads have a good deal of non-competitive business. This is only one reason, of course, and a secondary one; but we will not now stop to consider that phase of the subject.

The Hawkeye attacks the third point—that concerning the attitude of the courts. Prof. Adams criticizes the courts "as at present administered," but, says his Burlington critic: "The query naturally arises: 'Are the courts to which he refers not honestly administered? Are the judges incapable? Are they corrupt? How would Prof. Adams have them administered?' He makes reference to three cases only. One that he designates is the Counselman case, in which the Supreme Court decided that a witness need not testify should his testimony be such as to incriminate himself. That was a sound decision; it merely enunciated a principle as old as the common law, and founded in justice. . . ."

It may be added, in connection with the third point, that it is opening a wide door for speculation when one assumes that Congress placed upon its act any particular interpretation other than that deducible from the words of the act itself. It seems to us that in the case of the unsolvable problems dealt with by the Interstate Commerce law, Congress intended to leave them unsolvable, which, of course, was the only rational course that could be taken. Take the pooling clause, for instance. There has been much discussion as to what Congress meant by pooling; but is it not rational to conclude that Congress meant to leave it to the future to decide to what extent the law should restrict those traffic agreements, of various kinds, which have been loosely termed pools?

On the fifth point the Hawkeye accuses Prof. Adams of grasping for power, and says that if he wants more power for the department of statistics, let him show what practical value there is in the work he has already done. A competent railroad officer tells the Hawkeye that this work is practically worthless.

Other daily papers have published criticisms, of a more general nature, which we need not now repeat. The reader of the article will at once see that the main practical point in Prof. Adams' argument is the demand for more elaborate statistics, so that a Government official sitting in Washington can detect secret rate cutting in any part of the country, for that is what it amounts to. The rest of the article is a defense of the Commission, which has been already laid before the public by several other able writers; and, indeed, the plea for statistics has been presented by Prof. Adams before. As the rate cutting evil in this country is a very difficult thing to deal with, and as there is no experience in other countries which gives any light on the problem of its solution, Prof. Adams owes it to the public to tell in considerable detail just what he proposes to do. His idea is too novel to be readily accepted by any one who has not thoroughly studied the subject, and the proposed task is so vast that men of experience will not readily believe that a sure remedy for the trouble can be so easily found.

The evidence which shippers cannot get, and which Prof. Adams proposes to get for them, is evidence of secret rebates allowed by railroads to hundreds and thousands of shippers. (If these rebates were stopped there would be some public rate cutting and there would still be a "railroad problem," but for the present we may consider only existing conditions, and assume that if secret cuts are stopped many rate wars will be prevented.) Rebates

are paid in innumerable ways. Any favor to a shipper may be a rebate; a commission to a shipping clerk, a liberal payment for half fictitious damage to goods, a discount on some transaction not subject to the Federal law, a favorable contract for the use of factory side tracks—any one of a hundred such things may effect the desired favoritism. And the evidence produced, to be of any value to an aggrieved shipper, in a court, must deal with specific transactions, giving dates, names and amounts. What possible bureau of statistics could keep such a mass of facts? Not even a railroad president himself, on his own road, could get at any given set of facts of this nature without searching the detailed records of more than one office, or two. Unless the Government is going to gather transcripts of half the freight way bills made in the whole country and of all the treasurers' vouchers issued by every road—which would necessitate the employment of several thousand clerks—it is difficult to see what better it can do than to pursue the present method of securing the best available presumptive evidence of alleged wrongdoing. Unjust rate-cutting schemes can often be well shown up on ex-parte investigations, giving the public all needful information and exposing the motives and purposes of the rate cutters.

But when it comes to legal evidence of actual violation of specific statutes, we must consider two things, first, that the wisdom or justice of these statutes is doubted by many intelligent men, well qualified to judge; and, second, that the railroad business of the United States is too vast to be effectively dealt with in detail by any one body, public or private. As long as railroad corporations are not wholly public, there must remain strong reasons for allowing them to do some of their business secretly. If you do not make them divulge what price they pay for a piece of land or for a lawyer's services, there will be difficulties, legal and practical, in regulating prices for carrying passengers and goods. The only alternative yet devised is state management and operation. This means state ownership, and that is an expedient that the American people are not yet ready to try. If a Washington statistician represented the owners or managers of a railroad in Chicago, or California, he could readily get from the freight department any information he might want; but if he does not, it is difficult to see how the law can enable him to detect law breaking in financial dealings among railroad agents any more easily than similar offenses are discovered in other kinds of business.

The unusual number of railroad accidents in Germany last year has led some one to compare the deaths by these accidents with those by other accidents. The data are for Prussia for the five years ending with 1891 (later data were not accessible). In these five years the deaths by accidents of all kinds were 60,823, and of these 2,382 were by railroad accidents, but only 62 of these victims were passengers. Meanwhile 3,578 persons were killed by being run into or over by wagons or other vehicles, 1,483 by being thrown from such vehicles, 129 by being thrown from horses and 817 by horse kicks. So that the victims of locomotives were 2,328 and those of horses 6,007. This is all very well to show to an indignant public, but the railroad man will please bear in mind that he is responsible for the railroads and not for the horses, and that the railroad accidents are too numerous, even if they do not kill as many as some other casualties.

Changes in the Vanderbilt Lines.

President Chauncey M. Depew made public the following Wednesday afternoon:

To carry out the policy of greater unity of administration in the Vanderbilt lines, the following adjustment of the management will be made after the annual election of the New York Central & Hudson River Railroad Company, which occurs on the 20th of April. Chauncey M. Depew will retire from the Presidency of the New York Central & Hudson River Railroad and become Chairman of the Boards of Directors of the New York Central & Hudson River, the Lake Shore & Michigan Southern, the New York, Chicago & St. Louis and the Michigan Central Railroad. S. R. Callaway, President of the Lake Shore & Michigan Southern, will succeed Mr. Depew as President of the New York Central & Hudson River. Mr. H. B. Ledyard will remain President of the Michigan Central.

The Presidents of the Lake Shore & Michigan Southern and of the New York, Chicago & St. Louis have not yet been chosen. Cornelius Vanderbilt, in retiring from the Chairmanship of the New York Central & Hudson River and of the Michigan Central, and William K. Vanderbilt, in retiring from the Chairmanship of the Lake Shore and of the New York, Chicago & St. Louis, will remain in the directorates and continue their interest in the properties with which their name has been so long identified, and in which they have such large investments.

The Orleans Station in Paris.

The Orleans Railroad of France is preparing to spend 40 million francs in building about four kilometers of railroad into the heart of the city of Paris and establishing there two new stations. Plans have been made and it is hoped that the project can be completed in time for use in the Exposition year 1900.

This railroad has about 4,300 miles of line, serving the west and southwest of France. The present terminal station in Paris, Place Valhubert, shown on the sketch map, is a headhouse station far from the center of Paris and inconvenient in several ways. Passengers arriving very early or very late will find no means of communication with the center of the city, and for suburban passengers the time spent in getting to and from the heart of the city is a serious addition to the length of the journey. The situation is made more serious by the fact that Paris is growing toward the west, that is, away from the present Orleans terminal.

Naturally, it is difficult to find in Paris a central point easily joined to the present line and offering a surface of 25,000 or 30,000 square meters which might be converted into a terminal station. In 1862 the first station of the company was rebuilt at a cost of 18 million francs. In 1892 the company found it desirable to transfer its suburban station from Place Denfert (of the Sceaux line) to the Luxembourg. This operation was finished in 1895 and traffic was increased about 40 per cent., which was an encouraging example for future extension.

The present Valhubert station is on the left bank of the Seine. Four kilometers further, and also on the left bank of the Seine, is a great space occupied by the ruins of the Cour des Comptes, burnt in 1871 and belonging to the State. Alongside is an old barracks, the site of which might also be secured. It did not seem impossible to join this space with that of the present terminal station, following the quays along the Seine. Negotiations were opened and last December the necessary acts were passed through the Parliament.

The present station will stand with little change, but the tracks which run through the new station will drop on a grade of 1.1 per cent. for 440 meters to pass under the buildings which block their way, and under the Place Valhubert. Thence the line is directed toward the Seine. At the point where the bank of the river is encountered the quays are in two stories, the lower one used for river boat service and the upper as sidewalks, etc. The lower quay is very broad at this point and a belt 9 meters wide has been secured there for the railroad, which will thus be built in the open for 650 meters. Beyond this point the lower quay is narrow and the railroad line passes under the upper quay as far as the quay d'Orsay. There are several openings, however, on the river side which serve not only for light, but for ventilation.

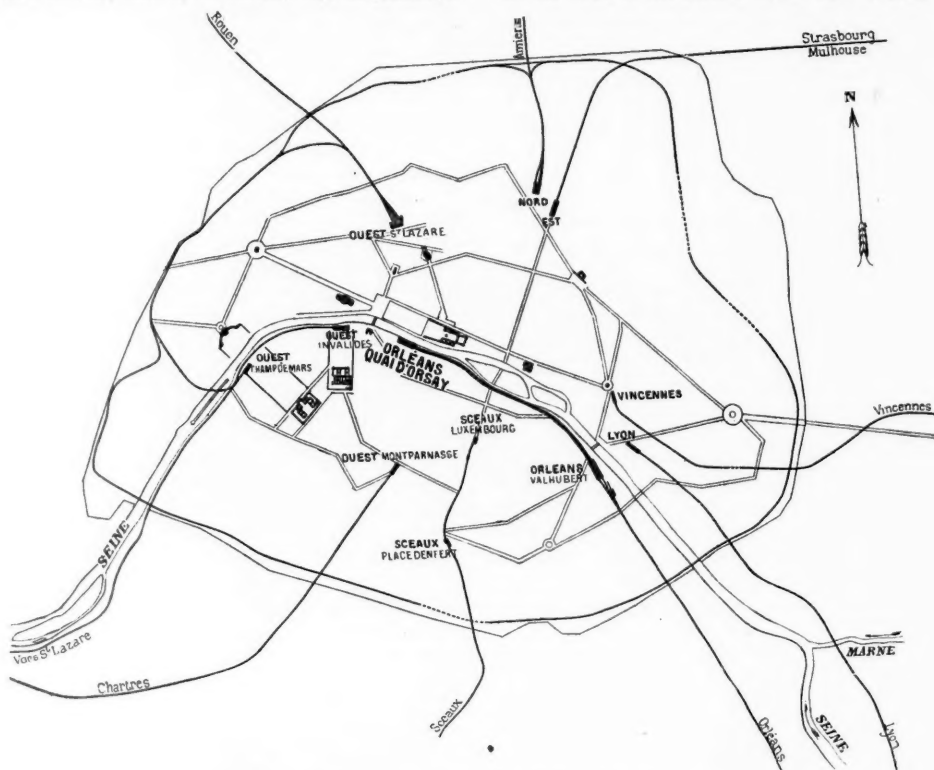
The profile is easy. Except for the first grade of 1.1 per cent., there are no grades greater than 0.5 per cent. The curves are nowhere less than 150 meters radius and more often 200. The rail level is about that of the ordinary stage of water. In flood time the bottom of the tunnel will be subject to upward pres-

built for about 500 meters, and until the Sceaux line is extended will be used for standing cars.

There will be two stations on this extension beyond the present Valhubert station; one of them, Place St. Michel, the other the terminal station of Orsay. The old Valhubert station will continue to be used for important service; that is, for certain express passenger

second and fourth platforms are designed to serve for the service of the station, baggage trucks, lamp trucks, etc., thus keeping all this movement away from the passenger platforms, a scheme which could be adopted with great advantage in some of our American stations.

At the head of the station is, as may be seen from



Sketch Map of Paris Showing Railroad Stations.

trains and for the express goods service, for military service, pilgrims, etc. The mail service also will be carried on there, and there trains which use the Orsay terminal will be made up.

The St. Michel station is designed to serve only for suburban movement and will not be available for passengers with baggage. The platforms will be raised to facilitate access to the carriages, and these will have a length of 230 meters.

The Orsay station was designed, in its engineering features, by M. Sabouret, Chief Engineer of the Central Service. The height of rail is about 25 ft. below the general street level and the station is, therefore, necessarily of two stories. On the lower plane all the train movements can be carried on, and the company was able to acquire the right to occupy considerable space here without actually purchasing the title to the surface. It undertakes to carry the structures overhead by a metal roof construction, the maintenance of which the railroad company will, of course, also guarantee. The general plan of the sub-

the drawing, a file of turntables. These are 6 meters and 20 centimeters in diameter, permitting short engines without tenders to be turned. Thus, an engine arriving at the head of its train can be turned and run to any vacant track and so go out of the station. For the first five tracks switches permit running an engine around its train without turning.

At the street level the station service is so arranged that all the arriving traffic is on the Rue Bellchasse and all the departing traffic is concentrated on the quay d'Orsay. Arrangements have been made for handling baggage by means of lifts and distributing it to and from the trains without interference with the passengers.

This station is in a very conspicuous situation, the locality being, in fact, one of the most elegant in Paris. It is near the Louvre and faces the Tuilleries and is close alongside the palace of the Legion of Honor. Naturally, it is important that the station should be a worthy piece of architecture and the company called for designs from a number of archi-

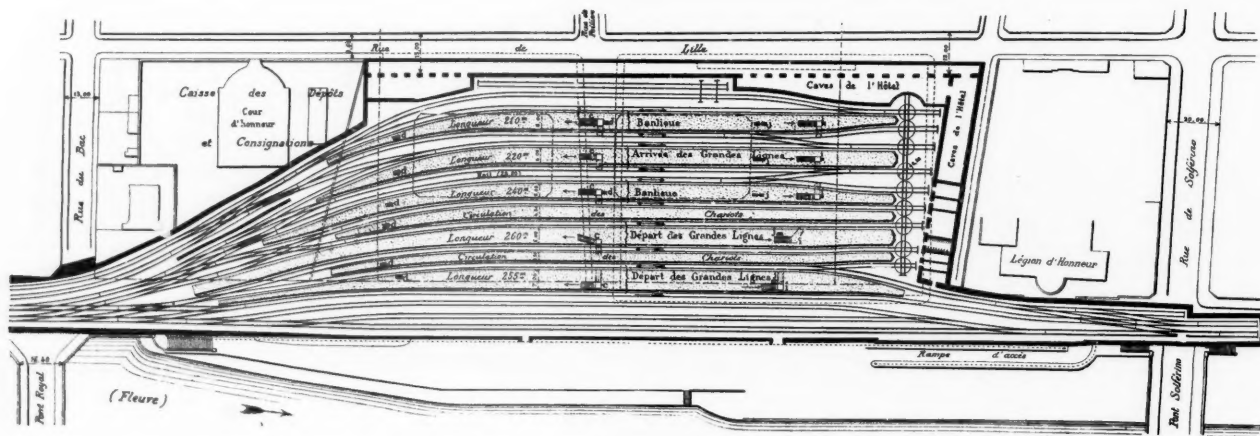


Fig. 1.—Orsay Station of the Orleans Railroad (Paris).

sure, and is built accordingly. Seepage water will be gathered in a central drain and pumped out.

Aside from that part of the line which is built in the open, there are four types of construction. From Pont Sully to the Little Bridge (Petit Pont), for 900 meters the construction is a masonry arch (Fig. 4) of 9 meters span. Beyond that the type of construction shown in Fig. 5 will be used, being a metal roof, the ground overhead not admitting a masonry arch. This will be carried for about 500 meters. Then the masonry arch will again be taken up, but this time with a span of not more than 8 meters. It is necessary, in fact, to leave room here to build eventually a second tunnel of 8 meters to give passage to the prolongation of the Sceaux line from the Luxembourg to quay d'Orsay. This second tunnel will, in fact, be at once

terranean layout is shown in Fig. 1. There are 15 tracks and by the disposition of switches, either one of these tracks can serve for arrival or departure. In fact, however, the present plan is to give up the three tracks nearest to the river as side tracks for trains and cars, to devote the next four tracks to long distance departing trains, the next two tracks to arriving and departing suburban trains, the two tracks next in order to arriving long distance trains, the next two tracks for the arrival and departure of suburban trains, and finally, two more tracks are for station service.

The platforms are from 185 to 240 meters long and from 6 to 7 meters wide. They are raised to 85 centimeters above the rail level. Consequently, one can enter the car directly without the use of steps. The

tests, which designs were submitted to a commission appointed by the Minister of Public Works. This commission selected the studies offered by Mr. Laloux, which studies will serve as the base on which the final project will be built up.

The work of prolonging the Sceaux line was done in open cutting and, in spite of all precautions, great complaints were had of the obstruction of traffic. Consequently, the company proposes to do practically everything now underground. The earth overhead will be supported by a metal shield which will be pushed forward by hydraulic presses, the masonry following up closely. Traffic on the streets overhead will not be interrupted. This system has been employed with great success by the municipal engineers in building a great collecting sewer.

We said at the outset that it is estimated that this enterprise will cost 40 million francs. This is distributed as follows:

Engineering, etc.	900,000 francs
Purchase of real estate	12,300,000 "
Substructure, including moving of sewers, etc.	17,550,000 "
Superstructure, including the main station	9,250,000 "
	40,000,000 "

For this information and the engravings we are indebted to the Revue Générale des Chemins de Fer.

The Proper Method of Braking with Double-Headers.

A subject for discussion at the February meeting of the Western Railway Club was, "When 'double-headers' are used on passenger or freight trains, is it good practice to cut out the brakes on the forward engine?"

Mr. S. J. Kidder, of the Westinghouse Air Brake Company, gave his opinion of the proper method of handling the brakes on trains hauled by two engines at the front end, in brief, as follows: There are instances where roads make a practice of cutting out the triple valve on the head engine, but still leaving the operation of the train brakes in the hands of the

The molding shop and the mill buildings of Rhodes, Curry & Co.'s car works in Amherst, N. S., were burned last week, the loss being between \$40,000 and \$50,000.

Fred A. Kummer, C. E., until recently general representative of the American Wood Preserving Co. of Philadelphia, has resigned that position to accept that of Sales Agent of the Eastern Paving Brick Co. of Catskill, N. Y., with office at 701 Bowling Green Building, New York.

Brooks Bros. & Co., Molena, Ga., offer for sale a lot of second-hand equipment, which includes 15 miles of 35-lb. steel rails, two locomotives, 15 logging carts, 12 two-horse wagons, 40 miles of galvanized telephone wire, with brackets and insulators for same; eight standard telephones, 18 logging cars, one stationary engine, one portable saw mill, one cut-off saw, one handcar.

Willis Shaw, dealer in contractor's machinery, has moved his Chicago office from 506 New York Life Building to 633 Marquette Building.

Hancock Inspirators and Hancock main steam and check valves made by the Hancock Inspirator Co., Watson street, Boston, Mass., are being applied to

The Q & C Co. has taken the Western agency of the Pennsylvania Steel Co., with headquarters at their general offices, Western Union Building, Chicago.

The Kansas City Tool & Nut Co. will build an addition to its plant, consisting of a steel frame 120x250 ft., designed by J. A. L. Waddell.

The Bass Foundry Co., Fort Wayne, Ind., has a contract for a pair of Corliss engines for the Inland Steel Co. of Chicago Heights, Ill.

The Aurora Boiler Works have been incorporated at Aurora, Ill., with a capital stock of \$25,000 by J. W. Battle, John Kelley and B. B. Scott, to manufacture boilers.

A New York newspaper contains the following item: Receiver Felton, of the Columbus, Sandusky & Hocking, has secured permission to issue receivers' certificates to the amount of \$16,000 in order to secure money with which to buy safety appliances for freight cars.

The American Steel & Wire Co. has been granted incorporation papers by the Secretary of State of Illinois. The company's headquarters are in Chi-

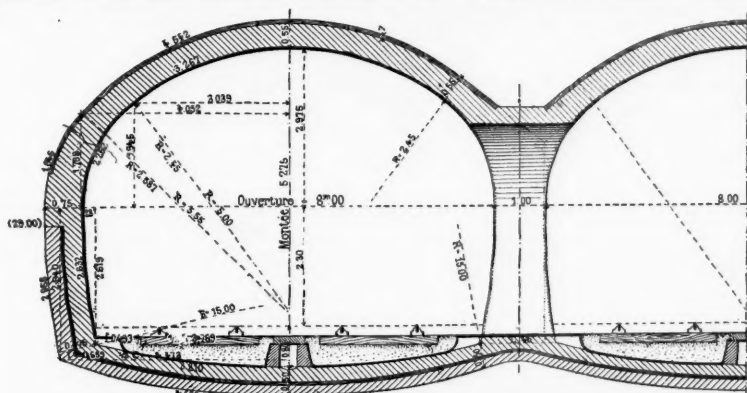


Fig. 4.—Orleans Tunnel (Paris).

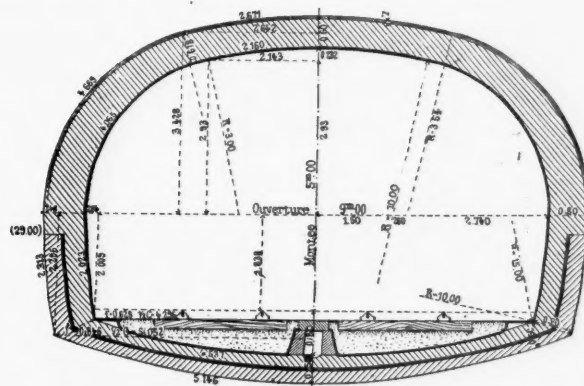


Fig. 5.—Orleans Tunnel (Paris).

engineman of the head engine. The object is, in case of a break-in-two, that the leading engine may get out of the way. It is a well-known fact that if we have freight trains partially equipped with air brakes, and the head engine becomes detached, that engine forges ahead several feet; the slack of the non-air brake cars, violently closing up, forces the second engine ahead suddenly, resulting in a more or less serious collision, as the brakes on the head engine have acted to retard it. The object of cutting out the air brakes on the head engine is to permit that engine to keep out of the way. If it could be shown, after an accident had occurred, that one of these engines was running over the road with the brakes cut out, it would establish a bad case against the railroad company.

It is no doubt true that there is not a sufficiently

the four locomotives now being built by the Baldwin Locomotive works for the Southern Indiana Railroad.

F. E. Brandis, Sons & Co., makers of engineering instruments for all purposes, have removed their office and works from 1768 Lexington avenue to 814 Gates avenue, Brooklyn, N. Y.

The Westinghouse Machine Company, Pittsburgh, Pa., reports the sale of 12 engines for the lighting plants on a line of new steamers being built by the Moran Bros. Company at Seattle, Wash., for the Yukon River trade.

Business with J. A. Fay & Egan Company of Cincinnati has increased to such an extent as to justify them in voluntarily increasing the wages of their employees 10 per cent.

The Ludlow Steel & Spring Co., of Pompton, N. J.,

cago. The capital stock is \$12,000,000, of which one-half is preferred stock and the other half common stock. The incorporators are John W. Gates, Isaac L. Ellwood and Elbert H. Gary.

The Lewis Foundry & Machine Co. of Pittsburgh has secured the contract for building a rail plant for the McKenna Steel Works Co. of Joliet, Ill., at Armourdale, a suburb of Kansas City, Mo. It will cover six acres and about 200 tons of structural steel will be needed for the buildings, which will be built by the Shiffler Bridge Co. of Pittsburgh. The machinery, consisting of two trains of 24-in. rolls, straightening presses, hot and cold saws, etc., is being made at the Lewis plant.

Iron and Steel.

The employees at the Sharon Iron Works and the Buhl steel mill, Sharon, Pa., on March 25 were granted an increase in their wages of 10 per cent. About 300 men are affected.

The Morgan Engineering Co., Alliance, O., has received a contract from the Government to build six 12-inch disappearing gun carriages and five 8-inch carriages for coast defense. They will be of the Buffington-Crozier model of 1896.

The S. T. Coplay Iron Co. at Coplay, Pa., was sold by the trustees to R. H. Gummere of South Bethlehem, Pa., acting for the bondholders for \$55,000 over and above the mortgage.

The Bureau of Ordnance on March 23 awarded contracts for projectiles to the Petersburg Iron Works and the Tredegar Company of Richmond, as follows: The first named company has secured 187 10-inch solid shot and 745 12-inch mortar shells, the latter being 800 lbs. each. The second named company received an order for 165 12-inch mortar shells of 800 lbs. each and 500 12-inch mortar shells of 1,000 lbs. each.

The Bethlehem Iron Co. has a contract to build a vault of Harveyized armor plate for the Philadelphia Savings Fund Society, Philadelphia, Pa.

The Bethlehem Iron Co. has received an order from the Government which includes seven 10-inch and six 12-inch disappearing gun carriages and five 10-inch guns.

The employees of the Erie City Iron Works have been notified that after the first of April there will be an increase in salaries of 10 per cent.

The Lancaster Malleable Iron Works of Lancaster, Erie Co., has been incorporated in New York with a capital of \$150,000. The Directors are: Clarence E. Rood, Eugene Chamberlain, Buffalo, and William Brownell of Lancaster.

At the annual meeting of the Harrisburg Foundry and Machine Co., Harrisburg, Pa., held March 24, the officers and directors were re-elected. A special committee was appointed to consider a proposition looking to a removal of the plant. It is possible that a larger site will be selected in Harrisburg.

The Boston office of the Pennsylvania Steel Co. has been moved from 8 Oliver St. to rooms 11 and 12, Ma-

secure connection between the two engines. The old-fashioned style of pencil drawbar is a very easy thing to break, and all the accidents that have come under my observation due to engines parting resulted either from the pencil breaking or one of the pins jumping out. I would urge that all brakes on the train be used, and I would also advocate that the connections between the two engines be such that this danger of breaking in two may be guarded against.

TECHNICAL.

Manufacturing and Business.

Louis B. Hasbrouck of New York and John E. Kraft of Kingston, N. Y., were appointed March 25 by Judge Pryor of the Supreme Court, Receivers of the Diamond Truck & Car Gear Co., Kingston, N. Y.

has been incorporated with a capital of \$5,000 by William E. Ludlow, Pompton; James Gore King, Rufus W. Peckham, Jr., and Daniel A. Warren, New York.

The Allentown Foundry & Machine Co. has elected officers and directors as follows: President, George O. Albright; Secretary and Treasurer, J. Winslow Wood; Directors, H. C. Trexler, D. L. Kistler and George T. Hersh.

The Star Coupler & Fitting Co., of Chicago, has been incorporated in Illinois with a capital of \$1,000 by A. M. Pence, G. A. Carpenter and Henry Bartholomey, Jr.

Frank W. Edmunds, for many years General Sales Agent of the Troy Steel Co., will after April 1 assume the active duties of Secretary of the Q & C Co., and be located in Chicago.

son Building. The company states that their street railway business has increased so in the past few years that they have outgrown their present accommodations. Among recent rail contracts which they have received is one from the Boston Elevated Railway Co. for 5,000 tons, one from the Fall River & Newport Street Railway Co. for 1,500 tons and one from the Fall River & Providence Street Railway Co. for 1,800 tons. They state that their bridge and construction department business has grown equally fast. Besides a contract for the southern terminal station, now nearing completion and involving nearly 10,000 tons of steel, they have recently completed a baseball cage for Harvard University, Wellesley memorial chapel for Wellesley College, and are erecting a new power station for the Boston Electric Light Co. They furnished the first three sections of the Boston subway and have recently taken a contract for the last section. The Northern Union station was built by them, and they are now completing the Southern Union station.

New Stations and Shops.

The Des Moines Union Railway Co. has not let contracts for the new Union station at Des Moines, the architect not having completed plans. The Wash, the Chicago Great Western, the Des Moines Northern & Western have contracted to use the new station.

Cuthbert & Sargent, the Topeka contractors, have the contract for finishing the shop buildings of the Atchison, Topeka & Santa Fe at Fort Madison, Ia. The shops have been in an unfinished state for several years.

The Southern Railway has under consideration the removal of the Memphis & Charleston shops, now located at Memphis, to Sheffield, Ala., but nothing has been definitely decided upon.

Car Lighting.

The newspapers say that the Rock Island trains now being fitted up for the run to Omaha and Denver will be lighted by electricity, using storage batteries. The fact is that Pintsch equipment has been ordered for these cars. They are, however, being wired for electric lighting, but no decision has been reached as to what electrical equipment, if any, shall be put in.

The Col di Tenda Tunnel.

The great Col di Tenda tunnel, five miles long, which was begun nine years ago, was opened through Feb. 14. It is nearly due north of Mentone, and a railroad between Ventimiglia, the first Italian station on the Mediterranean west of the French border, and Turin will pass through it. It has its importance in the defensive system of Italy on its French frontier, but for commercial purposes probably would never have been built. The pass has been crossed since 1883 by a carriage road through a tunnel 1½ miles long, and this took the place of a famous old road which zig-zagged up to the divide, 6,263 ft. above the sea, while the carriage tunnel requires an ascent only to 4,330 ft. The tunnel is only about 20 miles from the sea.

Testing Machines for the "Tech."

There is being designed for the Engineering Laboratory of the Mass. Inst. of Technology an impact testing machine on a large scale, for testing car axles and iron beams, transversely under impact and straight specimens in compression under impact. The machine is built something like a pile driver, with a hammer of 500 pounds and a maximum drop of about 8 feet. The principal casting will weigh between 24,000 and 26,000 pounds. A machine is also being designed for repeated stress in direct tension and compression, which will have a capacity of 100,000 pounds. The stress will be applied in tension and compression alternately, at the rate of 60 turns per minute, accurate measurements being taken in the meantime by micrometer readings.

An interesting piece of thesis work is being done in this laboratory on the durability of different forms of brake shoes. An apparatus will be rigged by which pressure can be applied to the brakes while the wheels are revolving, so that the pressure can be accurately measured; and the apparatus will be run continuously for a number of days, and the wear of the wheel and shoe noted. It is estimated that, with one set running at the speed of about 60 turns per minute, about 75 H. P. will be consumed. A new friction brake for measuring and absorbing power has just been delivered by the Taunton Locomotive Works, after a year's work. The brake is capable of taking up 100 H. P., makes 200 revolutions per minute, and weighs about 5,000 pounds. The brake wheel is about 5 feet in diameter, 15 inches face, and has a coil of pipe embedded in the rim of the wheel within half an inch of the upper circumference. The water used for cooling the brake passes through this copper tube and out through a hollow shaft.

The New York Canal Commission.

The Canal Investigating Commission of the state of New York met at Albany last Monday and selected Mr. Edward P. North, Vice-President of the American Society of Civil Engineers, as Engineer of the Commission. The Commission then adjourned to meet again on Monday, April 4. Meantime, the engineer and the counsel will prepare plans and outline the work of investigation.

New Foundry for the General Electric.

The General Electric Company has let contracts for a new foundry at Schenectady. The present foundry has been for some time inadequate to the demands, and considerable work has been passed on to the foundry at Lynn. The work has, however, grown beyond the capacity of both the Lynn and Schenectady foundries, working overtime, and all is now to be concentrated in the new foundry, building of which is to be begun immediately. The building will be of brick, 500 ft. long and 140 ft. wide with an "L" 100 ft. x 120 ft. The latter will be used as a cleaning shop. Besides these main buildings, a number of sand sheds, several smaller buildings for the storage of foundry material, and a new pattern store house 200 ft. long, 60 ft. wide and two stories high, will also be erected. All combined, the floor space occupied will be about 12,000 sq. ft. Plans are also under consideration for a new machine shop, 650 ft. long by 165 ft. wide, but the appropriation for this has not yet been authorized. The buildings will be erected on property recently purchased from the Gilbert Car Works, to the west of the present works and parallel with the Erie Canal. Every precaution will be taken to eliminate risk from fire; indeed the pattern storehouse will be made as fireproof as possible and the foundry will be a model of modern practice.

Superintendents of Bridges and Buildings.

A committee has been appointed by the Association of Railway Superintendents of Bridges and Buildings to investigate the "Cost and Manner of Putting in Pipe Culverts." To assist in this investigation engineers and others are asked to furnish to the committee the plans and information asked for below:

1. Do you use, on the railway with which you are connected, any form of cast iron, wrought iron, steel, cement, vitrified or wooden pipe culverts?
2. If so, please send plans and specifications for the different kinds of culverts you use, stating the minimum and maximum sizes of each kind of pipe. (Members are requested to send tracings when practicable.)
3. If more than one kind of pipe culvert is used, please state the considerations which decide the use of a certain kind in any given case.
4. Are end walls built at one or both ends? If so, are they built of wood, stone or concrete?
5. If end walls are not built in all places, state considerations which decide their use in any given place.
6. Please describe in full your method of putting in the different kinds of pipe culverts—
 - (a) When built to replace timber culverts.
 - (b) When built to replace wooden bridges.
 - (c) When built through a bank where there has been no previous opening.
7. Have you experienced any trouble from the breaking or flattening of pipe culverts, on account of the weight of the earth filling?
8. If so, what means have you adopted to overcome this difficulty?
9. Please give cost of pipe culverts of the kinds you use under the three different cases, dividing the cost, where possible, into the items of material and labor for the pipes and end walls.
10. Please give any other information on the subject, not covered by the above list of questions.

Replies should be addressed to W. A. Rogers, Assistant Engineer B. & B. Dept., C., M. & St. P. Ry., Chicago, Ill.

Treated Ties in Prussia.

It is notable that in Prussia, which has had many years' experience on thousands of miles of railroad with impregnated ties, the use of chloride of zinc, which has long been the prevailing one and has been reported to be substantially as effective as any other (and much cheaper), is now being given up, as "not sufficiently effective." An official of the railroad has lately testified before a committee of the Prussian Diet (which has to report upon estimates of expenditures by the railroads) that henceforth it is intended to preserve oak and beech ties with tar oil, and fir ties with a mixture of chloride of zinc and tar oil. The works have to be transformed for this purpose, and it is intended to enlarge them. Germany has had more experience with preserved ties than all the rest of the world together, probably, which makes its change in practice especially notable.

Nickel Steel at Krupp's.

Street car axles are being made at Krupp's Works (Essen) with 7 to 8 per cent. of nickel, as are also hollow driving axles for locomotives. In firebox steel as much as 25 per cent. of nickel is used. Less than 7 per cent. of nickel does not seem to be thought of any value in locomotive axles.

English Underground Electric Railroad.

One of the underground electric railroads which it is proposed to build in London is the City & Brixton line, the engineers for which are Sir Benjamin Baker, Mr. David Hay and Mr. B. Mott. The tunnels will run from a junction with the City & South London electric underground railroad, under the High Street, Borough, to Brixton Hill, in southwest London, the length being about 3 miles 5 furlongs, so that, with separate tunnels for the "up" and "down" lines, as on the City & South London, the total length of track will be 7 miles 2 furlongs. The City & Brixton line will be built in every respect similar to the City & South London, and it is proposed to buy over a portion of the latter line from the point where the new line will join it, to its termination in King William street, City. The engineers of the scheme have prepared, for Parliamentary purposes, detailed estimates as to cost of laying the lines and various works connected therewith. The total is given at about \$4,100,000, of which \$3,950,000 will be spent upon the railway itself, about \$125,000 upon widening the City & South London, and, as a subway is proposed

connecting to the Oval station of the latter line, about \$35,000 is set down for this. A company will be formed to work the undertaking, its capital being \$6,000,000, with the right of raising a further \$2,000,000 by the issue of debenture stock.

Steel for Coupling Links.

The advisability of using steel coupling links was a topic for discussion at the February meeting of the Western Railway Club. Mr. Ira C. Hubbell, Purchasing Agent of the Kansas City, Pittsburgh & Gulf, stated that his road, last year, commenced using steel links, and, so far as he could ascertain, they had given as good service as the wrought iron links previously used. Of the steel links which had been reported broken, none broke at the weld, which is considered to be the weak point of a steel link. Mr. William Forsyth, Mechanical Engineer of the Chicago, Burlington & Quincy, stated that steel links fully meet the specifications under which links are purchased, and often exceed the requirements for strength. Further, that steel links, if of good material and properly welded, are, in his opinion, to be preferred to iron links.

Pneumatic Tools in Europe.

We have received a communication from Mr. J. W. Duntley, President of the Chicago Pneumatic Tool Co. (who is in Europe), in which he gives some figures showing the progress made in the introduction of pneumatic tools in various parts of Europe. During the months of January and February the London office sold 141 Boyer hammers, 82 Boyer drills, seven Chicago breast drills, 15 riveters, three casting cleaners and three flue rollers. During the first six days of March they sold 30 more hammers, 15 Boyer drills, six breast drills and one casting cleaner. The Paris agents placed 48 hammers and drills during January and February, and 56 hammers and drills were sold during these months by the Vienna agent. While in Berlin, on the 16th of this month, Mr. Duntley received an order for 100 hammers, 60 drills, 10 riveters, five flue rollers and 20 breast drills. He has also contracted for stock orders for the different offices of the company in Europe for more than 200 machines to be distributed each month. On account of the large amount of work received, the company will be compelled to either build a plant in Europe or double the capacity of its plant in America. Recommendations have been received from a number of prominent engineers in Europe testifying to the efficiency of the labor saving devices made by the Chicago Pneumatic Tool Co. This is the third trip Mr. Duntley has made to Europe in the past two years.

Nickel Steel for Crank Pins and Axles.

In the Railroad Gazette of Feb. 25, page 137, appeared an article under the above title. We find in the official Proceedings of the Western Railway Club (February issue), a paper on the same subject and by the same author which differs but little from that which we published some days earlier than the Proceedings were issued. According to the well established etiquette governing the relations of the technical journals to the technical clubs and societies, it is seldom permissible to publish a club paper in advance of its appearance in the Proceedings of the club for which it was prepared. This etiquette we try to observe scrupulously. We shall not attempt in this case to place the blame for the appearance of the paper in our columns before the club Proceedings were published, but we hereby offer our apologies to the club for this breach of custom.

Acetylene Headlight for Locomotives.

In our issue of March 18 we printed a letter from Mr. P. W. Resseman, General Superintendent of the Pontiac Pacific Junction Railroad, giving results of lighting cars with acetylene gas. On March 15 a test of a locomotive headlight, lighted with acetylene gas, was made on the Canada Atlantic Railroad. The makers of the headlight, Messrs. Holland Bros., of Ottawa, Ont., inform us that the test was highly satisfactory, the light being steady and very brilliant. The apparatus for generating the gas is placed in the cab of the engine so as to be under the immediate supervision of the engineer, who, by replenishing the lamp, can maintain a continuous light for any number of hours. Messrs. Holland Bros. are now introducing the use of acetylene gas for lighting cars and locomotive headlights in the United States.

M. C. B. Association—Care of Journal Boxes.

The Committee on Care of Journal Boxes—Best Method of Packing—ask for replies to the following questions, to enable them to make up a report to present at the convention to be held at Saratoga next June:

- 1st. Would you recommend a high or low grade oil?
- 2d. What does it cost you per 1,000 miles for car lubrication?
- 3d. Do you use any special cooling compound to prevent or cool hot boxes? If so, please state what it is and what your experience has been with same.
- 4th. How much oil do you use per car, per 1,000 miles?
- 5th. What is the average number of hot boxes per 1,000 miles?
- 6th. Do you prefer cotton or woolen waste, and why?
- 7th. Is there any other material, whether patented or not, that you would recommend instead of waste for packing, and why?
- 8th. How long do you consider it necessary to soak waste before using, and at what temperature?
- 9th. What device, whether patented or not, do you recommend to prevent dust from entering rear of journal box?
- 10th. What journal-box lid, whether patented or not,

do you prefer, that would prevent leakage of oil and at the same time be dustproof?

11th. What particular method, if any, have you in arranging the packing in the journal boxes?

12th. Do you consider it good practice to remove the old packing, mix the best of it with new, thoroughly saturating waste for repacking? If so, how often should this be done?

Kindly address replies to the chairman, J. T. Chamberlain, M. C. B., Boston & Maine Railroad, Union Station, Boston, Mass.

THE SCRAP HEAP.

Notes.

The conductors and porters on Pullman cars have been ordered not to wear tan-colored shoes.

On the Cincinnati, New Orleans & Texas Pacific station agents now wear uniforms, a change which, it appears, is an innovation in that part of the country.

The general offices of the Pennsylvania Railroad at Philadelphia are hereafter to be closed on Saturday afternoon during eight months of the year; that is, from April 1 to Dec. 1.

A movement is on foot in the Illinois Legislature to secure the passage of a law looking to the abolition of grade crossings, following the plan adopted in Massachusetts and New York.

The Iowa State Board of Railroad Assessors has completed the list of railroad property for the current year, the aggregate valuation being \$44,000,000, which is about the same as last year.

On the Baltimore & Ohio Railroad in West Virginia about sixty engineers and firemen were lately reported sick with typhoid fever, caused by drinking infected water from locomotive tenders.

The Canadian Pacific is to put up a copper telegraph wire from Montreal to Vancouver, 2,910 miles. The wire will weigh 300 lbs. to the mile, and it is intended to work the line duplex, with repeaters at Fort William and Swift Current.

An Omaha paper reports that the Union Pacific has agreed to give \$25,000 toward the maintenance of the Trans-Mississippi Exhibition, which is to be held in that city the coming Summer. Most or all of the other railroads contributed last year.

The Rock Island and the Union Pacific, competing for the carriage of mails between Kansas City and Denver, have quickened the time of their trains three or four times within the past two or three weeks. By the last schedule reported the time between the two cities, west-bound, was 15 hours. The distance is 640 miles. The trains of the rival roads run over the same track a part of the way.

The Railroad Commissioners of Mississippi, in a complaint entered at Natchez, have decided that the Ratliff Transfer Co. of that city is exercising an unlawful monopoly in soliciting baggage on the trains of the Yazoo & Mississippi Valley and of the New Orleans & Northwestern. While the agents of this company solicit regularly on incoming trains, the Natchez Transfer Co. was kept out, and complained to the Commission of loss of business.

On the night of March 22 a Southern Pacific passenger train was stopped near Goshen, Cal., and the express car was robbed, the safe being blown open. It is said that the robbers got as much as \$50,000. A passenger says that they compelled the engineman to stop the train so that all of the passenger cars were on a high and narrow trestle, while the express car was on the embankment. On the 29th a west-bound passenger train of the Santa Fe was stopped by robbers near Grant, N. M., but the express messenger opened fire upon them and they fled, one being wounded.

In the Congressional Appropriation bill for the Post Office Department, which has been adopted in the House of Representatives, there is an amendment making it a misdemeanor for any person to "pad" the mails during the period when the bags are being weighed to determine the rate of compensation to be paid to the railroads. In the discussion on the bill there was a strong effort to defeat the appropriation for pneumatic tube mail service in New York, Boston and Philadelphia; it was unsuccessful, but the House voted that no new contracts be made for tube service.

Press dispatches from Lincoln, Neb., report that the State Board of Transportation is determined to try the experiment of reducing freight rates, in spite of the nullification of the Newberry law by the recent Supreme Court decision. The Governor declines to call an extra session of the Legislature, because he thinks that any action taken would probably meet the same fate as the Newberry bill, and the Board of Transportation, therefore, is going to order a reduction of 10 per cent., basing its action on a complaint filed some time ago by the editor of a country newspaper.

The officers of the Union Pacific have decided that the hospital fund, made up from contributions of employees and accumulated during a term of years previous to the receivership, shall be distributed to those who contributed the money, and all persons who have worked for the company during the past twenty years have been notified to send to the auditor their address and their record of service. It is said that

more than 30,000 persons will participate in this distribution; and since the newspapers began to announce that such disposition would be made of the money the officers of the road have been receiving 200 letters a day asking for a share of the fund.

On the Meadville Division of the Erie, and on the Western Division of the Philadelphia & Erie, "19" train-orders are now delivered to enginemen (without requiring the train to stop) by means of a hoop about 18 inches in diameter, which the engineman catches by running his arm through it as it is held up by the station man. It is said that hoops can be caught at 40 miles an hour. They are made of wood and weigh only one ounce each. The order is held in the hoop by a spring and the station man holds up the hoop by means of a stick, to which it is attached by means of a string in such a way that it is easily taken off. Tablets have been thus delivered to the engines on the railroads of India for many years.

North Carolina papers report that Mr. Caldwell, Chairman of the State Railroad Commission, has repeated of his radical action in voting to reduce passenger fares on the railroads of the state, and acknowledges that the appeal of the railroads to the courts ought to be successful. He says that he foolishly yielded to the clamor of the politicians at the Populist State Conference. Indeed, the Commissioner's change of heart is so radical that he thinks the Railroad Commission ought to be abolished entirely, thus saving the State \$12,000 a year. He thinks that in view of the decision of the Supreme Court of the United States in the Nebraska rate case, the power of railroad commissions is not of much account. The commissioners have postponed for 10 days the date for putting the reduced fares in effect.

Cable Traction in Scotland.

Cable traction is having a spell of prosperity in a few places in the United Kingdom, particularly in Edinburgh, where arrangements are being made for cabling the street lines as far as Meadowbank, and the Portobello lines, which have been purchased by the municipality, are to be similarly equipped. The tramway company is equipping some of its lines, and has placed contracts for 120 cable cars, at about \$1,600 each, and 250 grippers at about \$260 each, as well as for considerable quantities of cable.

The Town Council of Leith, which is to take over the street tramways from the local company, contemplates cable traction in lieu of horses, and a report on the question of the conversion and re-equipment has been drawn up by Mr. Colin, C. E., who considers that the route proposed can be economically and satisfactorily worked by cable.

The cable line laid on that very steep incline, Highgate Hill, in London, which was opened about a year ago, after some years' idleness, has just had a new cable.

It is interesting to note that the Isle of Man Tramways Company, which has so successful a set of electric trolley lines running throughout the Isle of Man, and is even now constructing a further similar line from Laxey to Ramsey, has been trying its new cable section, with results not by any means satisfactory, for we understand that the loss on the first half-year's working of the cable section has been exceptionally heavy, owing to many unforeseen circumstances, and through frequent stoppages. With the experience gained, however, the management confidently hopes this year to have a satisfactory return on the cable lines.

A Steamship Route to the Yukon.

Among the companies whose steamers will connect the Western ports of the United States with the gold country of the Yukon is the Seattle-Yukon Transportation Co., whose headquarters are at 90 Columbia street, Seattle, Wash. This company operated on the Yukon River last year and carried mails for the United States and Canada. W. D. Wood, formerly Mayor of Seattle, and now the President of the company, is wintering on the Yukon and superintending the building of warehouses at Munook, Circle City and Dawson City. With the company's warehouses at Seattle and St. Michael it is in position to make good its promise to hold shippers' goods at any point desired, free of storage and of insurance. The company has three steamships and a brig which make the connection between Seattle and the mouth of the Yukon at St. Michael; thence passengers and freight are carried up the river on the company's fleet of four river steamers. The first steamer will sail from Seattle June 8. The fare to Dawson City, including berth, meals and 150 lbs. of baggage, is \$300. Freight is carried at the rate of \$10 per 100 lbs., no limit being fixed to the amount shipped. The officers elected at the annual meeting at Seattle March 11 are as follows: President, W. D. Wood; Vice-President and Manager, A. L. Hawley; Treasurer, E. Shorrock; Traffic Manager, Charles H. Norris.

Buildings for Para.

The announcement is made of a call for bids for the construction, in the City of Para, Brazil, of an abattoir and stables, and two markets; also for opening up two avenues in that city. Proposals for the construction of these works will be received by Senor J. Coelho, Secretary of the Municipality of the City of Para, until July 24, of the present year. The general terms of the proposals may be obtained upon inquiry at the Bureau of the American Republics, Washington, D. C.

Proposed Street Railroad Legislation in New Jersey.

A bill affecting the granting of franchises to street railroads passed the lower house of the New Jersey Legislature recently without debate, it is stated, and without a dissenting vote. The bill limits the period of time for which corporations may use or occupy any public street or highway under any consent, permission or franchise hereafter granted. It makes it unlawful for any governing board of a city, township or borough, or a board of freeholders, to grant to a street railroad company any franchise extending for a longer period of time than twenty-five years. The bill has yet to pass the Senate.

South American Notes.

The Truxillo Railroad in Peru is to be extended by a branch 50 miles long to Pampas, in the direction of the city of Cajamarca. From this terminus the shortest and easiest available route for mule travel is found to the rich mining region surrounding Cajamarca.

About 90 per cent. of the outstanding Ecuadorian bonds were deposited in accordance with the offer of the American company which has undertaken to liquidate the foreign debt of Ecuador and complete the railroad from Guayaquil across the Andes to Quito. The depositors received \$2 10s. for each bond, and on May 1 the railroad company will issue in addition for each bond a railroad bond for \$175, bearing 6 per cent. interest.

In 1897 there entered the port of Valparaiso, Chile, 915 steamers, with a total tonnage of 1,017,249, and 232 sailing ships, aggregating 229,195 tons. The clearances in the same year were 911 steamers with 1,018,267 tons, and 235 sailing ships with 239,239 tons. These figures are strikingly close to those for 1896. The ocean passenger movement at this port for 1897 was represented by 18,351 entered, and 13,807 departed, as against 19,690 landed and 15,097 sailed in 1896.

The so-called "White scheme" for harbor works at Valparaiso, Chile, has been submitted by the Chilean Government to a naval commission, and if the report is favorable, the beginning of this extensive undertaking will soon be witnessed. It provides for a breakwater 3,130 ft. long, estimated to cost \$5,000,000. The scheme also includes custom house, warehouses, sheds, yards, electric light, hydraulic cranes, light houses, the formation of 200,000 square meters of land, with space for docks, workshops and an arsenal. The harbor will have a width of 1,300 ft. for the whole length of the breakwater, with a minimum depth of 27½ ft. The total cost is estimated at \$15,000,000.

The Panama Star and Herald gives the following list of all railroads now in operation in Colombia:

Dept. of State.	Line.	Length.
Antioquia.....	Puerto Berrio to Pavas.....	51 kiloms (=31.62 miles)
Bolivar.....	Barranquilla to P'to Colombia.....	28 " (=17.36 ")
"	Puerto Velillo to Car tagena.....	17 " (=10.54 ")
"	Calamar.....	105 " (=65.10 ")
Cauca.....	Buenaventura to San José.....	39 " (=24.18 ")
Cundinamarca.....	La Sabana to Girardot.....	4 " (=2.48 ")
"	Girardot to Juntas.....	42 " (=26.04 ")
"	Zipaquirá.....	35 " (=21.70 ")
Magdalena.....	Santa Marta to San Juan.....	36 " (=22.32 ")
Panama.....	Panama to Colon.....	78 " (=48.36 ")
Santander.....	Cucuta to P'to Villamizar.....	55 " (=34.10 ")
"	Puerto Wilches.....	2 " (=1.24 ")
Tolima.....	La Dorada.....	2 " (=1.24 ")
"	Tolima.....	6 " (=3.72 ")
		521 " (=323.02 ")

Contracts are signed for the completion of an additional 350 miles within the next four years.

Traffic movement on the Magdalena River during the past year showed 312 up-river voyages, carrying 29,000 tons of freight, and 315 down-river voyages carrying 23,000 tons, the total passenger movement both ways being 14,000. Cotton shipments begin to figure in Colombian exports, reaching 2,837 bales in 1897. The shipments of ivory nuts are again increasing largely.

According to Mr. Ottomar Haupt, the condition of the Huanchaca Mining Company in Bolivia is so serious that reorganization and change of management may be necessary. This, perhaps the richest and most extensively developed silver mine in the world, has become involved in a financial tangle that has been growing steadily worse ever since the sudden ingress of waters a couple of years ago which flooded the deeper and better workings. The production is now from the upper galleries only, and it would appear that for the present at least no effort will be made to drain the mine, although an expensive Cornish pumping plant of large capacity has been installed. The company has been forced to contract heavy loans, and creditors are uneasy. Meantime the interest at 6 per cent. on the bonds of the Antofagasta Railroad must be remitted, and under these trying circumstances Mr. Haupt suggests that the holders of Antofagasta Railroad bonds accept part of their interest in the form of certificates of the Huanchaca Co., with an understanding as to the reorganization of the latter company. Mr. Haupt says this suggestion emanates from some of the large French shareholders of the company.

The Omaha Exhibition.

The New York State Commission to represent the State at the Trans-Mississippi and International Exposition at Omaha has organized by the election of Chauncey M. Depew as President. It was decided to ask the Legislature for \$25,000.

Widespread Floods.

On March 23 and 24 great damage was done by floods in Ohio, Indiana, Illinois, West Virginia and Western Pennsylvania. Dispatches from Pittsburgh on the 23d estimated the total loss in that region at \$2,000,000, and on the following day an estimate made at Indianapolis of the damage to railroad property alone on lines entering that city aggregated \$800,000. Probably these estimates include loss of traffic and may be much exaggerated, but washouts innumerable are reported from all quarters, and some cities report scores of families driven out of their houses. At Cincinnati the river rose to a height of 60 ft., and all but one of the railroad lines leading to the central passenger station were overflowed and impassable. Some of the lines of the Big Four and the Pennsylvania in Ohio and Indiana were impassable for three days or more, and this appears to be true not only of minor branches, but of important divisions. The Baltimore & Ohio suffered seriously on its Central Ohio Division. The Big Four lost a bridge at Cleves, and a one-span bridge of the Cincinnati, Hamilton & Dayton at Hamilton was swept away. The last-named road was made impassable by many washouts between Piqua and Hamilton. A report from Toledo says that the damage done on the Wheeling & Lake Erie amounted to \$200,000, many new embankments being damaged. There were a number of bad washouts on the Michigan Division of the Vandavia. The Buffalo, Rochester & Pittsburgh lost a bridge at Big Run, Pa. The Pennsylvania lost a bridge at Newark, O. Much damage was done by high water in the valley of the

White River, in the northwestern part of Arkansas. Several train accidents have resulted from high water, but only one resulting in loss of life has been reported. A work train on the Pennsylvania lines broke through a trestle weakened by the floods, near Columbus, Ind., and several lives were lost.

Heavy rains fell in Central Illinois on March 26, and the floods in all the rivers were reinforced. A dispatch from Bloomington states that a bridge of the Chicago & Alton near Mason City was washed away on the 27th, only a short time after a passenger train had passed over it.

Truck Tanks for Average American Practice.

The following is from a discussion by Mr. J. A. Carney, Master Mechanic, Chicago, Burlington & Quincy, at the March meeting of the St. Louis Railway Club of a paper presented at the November meeting of the Club.

Mr. George B. Leighton in his paper, "English Railway Practice," makes the following statement: "The use of the track tank allows the use of smaller and lighter tenders. . . . This is a point, it seems to me, that the American trunk lines do not appreciate."

The track tank system is being used by a few Eastern railroads, running through a country where good water can be had almost anywhere, and there is no doubt but that they could increase the practice to their advantage. But railroads running in the central and western portions of the country have so much trouble in getting water of any kind that the question which agitates them is, "How are we going to get water?" and not "What is the best method of getting water into engine tanks?" On a railroad covering a distance of some five hundred miles there are but eighteen supplies which can be depended upon the year round. Nine of these are less than 20 miles to the next nearest supply; three are between 20 and 35 miles; one between 35 and 50 miles, and four over 50. The greatest distance between permanent supplies is 74 miles. Of course, there are supplies of some sort between these points, but they are not certain, and during dry seasons many of them fail completely. The permanent supplies are used as much as possible the year round, and in order to do this, large tanks have to be used. The standard tank on this road holds 3,480 gallons. Several tanks have been enlarged to hold 4,200 to 4,500 gallons, and one has been built to hold 5,000 gallons. Another railroad has found it necessary to make longer runs for water, and is enlarging its small tanks as fast as they come into shop. The use of large tanks and long runs for water has been forced upon Western railroads, and the track tank system can never come into general use in those portions of the country where permanent water supplies are few and far between.

The Supreme Court of Wisconsin on Trolley Roads.

A decision which will be of interest to every electric railroad in the country has been handed down by the Supreme Court of Wisconsin to the effect that there can be no extension of street railroad lines beyond city limits, even though a franchise has been granted, without the award of damages where property owners object. It makes no difference whether or not the companies have the right to carry freight or express matter. When the courts decided that the street railroad was not an additional burden upon the highway cars were drawn by horses; since the use of electric motors the status of the street railroad is more like that of standard railroads.

Brazilian and Venezuelan Tariffs.

United States Minister Conger has sent to the State Department a copy of the new Brazilian tariff in which the duties on railroad cars are defined as follows: Railroad coaches or wagons increased from the tariff of 1896, from 20 per cent. ad valorem to 30 per cent.; axles reduced from 800 reis (11.2 cents) a kilogram to 400 reis (5.6 cents); braces, hubs, tires and other appurtenances of iron or wood reduced from 1,400 milreis (19.6 cents) to 400 reis (5.6 cents); a kilogram; springs reduced from 1,400 milreis (19.6 cents) to 400 reis (5.6 cents) a kilogram; wheels, taxed in the 1896 tariff 28 milreis (\$3.92) and 14 milreis (\$1.96) a pair for carriages and 20 milreis (\$2.80) or 10 milreis (\$1.40) for wagons, are taxed in the 1897 tariff 650 reis (9.1 cents) a kilogram, at 5,600 milreis (78.4 cents) for unfinished and 44,800 milreis (\$6.27) for complete are in the 1897 tariff taxed 650 reis (9.1 cents) a kilogram for wooden and 450 reis (6.3 cents) for wooden and iron; parts and appurtenances not specially mentioned reduced from 67 per cent. to 60 per cent. ad valorem.

According to the Venezuelan customs tariff for 1897-1898, carriages, accessories, and materials, intended exclusively for railroads, are admitted free of duty.

The State Legislatures.

Governor Black of New York has signed the bill which exempts railroad companies from that provision of the corporation law which prevents corporations from incurring liabilities in excess of their paid-up capital stock. This exemption was necessary to enable the New York Central to issue bonds for the purchase of the stock of the Lake Shore & Michigan Central.

Governor Bradley, of Kentucky, has vetoed an employers' liability bill passed by the Populist majority in the Legislature of that State.

The Legislature of Iowa has appointed a committee to visit the managers of the railroads and see that stop-over privileges are allowed to passengers going from the East to the Omaha Exhibition this Summer. It is deemed highly important to dispel the erroneous notions concerning Iowa that have found lodgment in the minds of Eastern people.

In the Ohio Legislature the proposition to pass a general 2-cent fare law seems to have been given up, but in place of it there is a bill which, it is reported, has been passed in both houses requiring the railroads to sell to all applicants 500-mile tickets good for the user and his family or firm.

A member of the Ohio Legislature has introduced a bill based on the law of New York to prohibit ticket brokerage. In the New York Legislature a bill has been introduced to repeal the law passed last year, and those railroad officers who worked so hard to procure the passage of that law now have to be equally vigilant and energetic to prevent the nullification of their work. Those who are working up a public sentiment for and against the federal anti-scalping bill seem to be as industrious as ever. Boards of trade in various cities, including Boston, have recently passed resolutions favoring the bill,

while the commercial travelers, who are against it, continue to hold meetings now and then. The Board of Directors of the Commercial Travelers' National League held a meeting in New York last week, and, it is said, engaged an eminent lawyer to go to Washington in their behalf. It is said that the Senate Committee on Interstate Commerce will "hold up" the anti-scalping bill until the railroads agree to withdraw their opposition to the Cullom bill, which is designed to increase the powers of the Interstate Commerce Commission.

Reports from Toledo, Indianapolis and other cities indicate that, since the use of the interchangeable mileage ticket became general, the ticket brokers in central territory are having very hard times and that some of them are going out of business.

An Arctic Railroad.

There is now a prospect of a railroad to extend entirely across Northern Sweden and Norway from the north end of the Gulf of Finland northwest to Ofoten, on the Atlantic about 120 miles north of the Arctic circle. A part of the route is formed by an old railroad built for carrying iron, most of which is north of the Arctic circle, and Sweden has now provided for extending it 148 miles to the Norwegian border at a point only 25 miles from Ofoten. At the other end the railroad will connect with a line in Finland, down the east coast of the Gulf of Finland, and from the Finnish border to Ofoten the length of the line will be just 300 miles. The Swedish line is estimated to cost about \$6,000,000, and is to be built largely for strategic reasons. This line will be further north than any part of the new railroad to Archangel. It will connect through Finland with the whole system of Russian railroads, but it is not probable that there will be much interchange between them.

Wages and Expenses in England.

The Economist, in a study of the increase of expenses of the English railroads since 1893, shows that of a total increase of £1,956,200 on the ten leading railroads, £1,033,000 was in wages paid; which increased 13 per cent. Traffic has increased meanwhile, however. In this country the amounts paid in wages decreased materially after 1893; but so did the traffic.

A Remarkable Accident.

According to a daily paper, this is what happened: "While wildcat engine No. 4, drawing a load of freight and coal cars, was running west, the main shaft connected with the driving wheels of the engine broke and punched out the cylinder head of the steam chest."

The Sand Track.

A railroad officer of large experience, not only as an engineer, but as an operating officer, who has recently traveled in Germany, says that the sand track so much talked about is practically a failure. The yardmen prefer to use other appliances, and one sand track which he saw was being loosened with picks. The sand seemed to have become about as hard as a common wagon road.

High Explosives.

At the meeting of the Engineers' Club of Philadelphia March 19, Mr. L. Y. Schermerhorn, President of the Club, opened a topical discussion on high explosives. On the question of sympathetic explosions of high explosives Mr. Schermerhorn said that in his work of removing a reef in one of the great lakes he had made experiments to determine at what distance a charge of dynamite under water would be exploded by the explosion of another charge. With holes five feet apart, and 12 pounds of dynamite in each hole, he placed exploders in every other hole. Sometimes all would explode and sometimes they would not. He could never discover the reason for the difference. On one occasion, with 25 holes loaded and but five primed with exploders, the whole 25 went off and nearly wrecked the scow, which was 30 feet away. What the conditions were producing that result he never knew.

High explosives, to be effective, must be near the object to be injured. Experiments made by the British Government showed that 500 lbs. of guncotton exploded 100 ft. from a vessel did not injure it. At 30 ft. the side plates were driven in and the frames were distorted. A general conclusion has been reached that the value of torpedoes or mines when brought in contact with an enemy's ships depends upon their being placed within a very limited distance of the hull of the vessel.

A curious fact in regard to the transmission of the shock of explosions was noted by Mr. Schermerhorn. Three distinct vibrations had been noticed by him, transmitted respectively by the earth, the water and the air. The vibration through the earth is the heaviest and the first to be perceived.

Theses at the Massachusetts Institute of Technology.

Among the theses undertaken by the students of civil and sanitary engineering are a design for a steel highway bridge across the Charles River, between Cambridge and Brookline, with a drawspan similar to the Scherzer rolling lift drawspans; experiments on the pipe line that the city of Cambridge has running from Stony Brook to Fresh Pond, including measurements of the flow through pipe, of the friction loss, and of the change in the carrying capacity of the pipe which has been in active use for about fifteen years (this case is especially interesting as the line runs for part of the way above the hydraulic gradient); a two-hinge steel arch span of 100 ft. to carry a four-track railroad with ballasted floor, similar to the Washington bridge in New York; a series of experiments to determine the coefficient of friction of liquids under very low heads and in small pipes.

Electric Railroads in Seoul, Corea.

The United States Consul General at Seoul, Horace N. Allen, reports a company formed in that city for lighting the streets and residences with electricity and for operating electric street railroads through the principal thoroughfares. Work on the street railroad will be begun at once. The company, known as the Seoul Electric Company, is composed entirely of Koreans, with the governor of the city as president. They have an exclusive franchise and have paid in about one-half of the capital of \$300,000. This company has made a contract with Mr. H. Collbran of Denver, the American contractor for the construction of the Seoul-Chemulpo Railroad, for the construction and equipment of an electric trolley street railroad of the latest and most

improved design. The railroad will be about six miles in length, and will run from the station of the Seoul-Chemulpo Railroad, through the south gate of the city, along the broad streets, past the new palace and foreign quarter, through the busiest part of the city and the great east gate, to the tomb of the Empress. Mr. Collbran has received a cash payment of \$100,000 with his contract, and the work will be rapidly prosecuted.

Bill-Board Box Cars.

The Atchison, Topeka & Santa Fe has made a contract with a Chicago company permitting its freight cars to be used for displaying advertisements of "pills, powders, plasters, soaps, stoves, sausage, cigars, snuffs, cookies, cradles, trousers, teapots, pickles, etc.," in fact, says a local paper, converting the cars into bill-boards. We have read recently in a Texas paper that the "Chief of the Department of Economy" of the Atchison was very active in his attentions to the various other departments of the road down that way, but we did not suspect that it had got so bad as this. However, we ought to be thankful that it is no worse. Freight yards can be inclosed with high board fences if necessary, and the passengers protected; and we can continue to reproach the English railroads for allowing their passenger stations to be entirely covered with bicycles and corsets, beer and cough-cures. When the Atchison cars are let out of the yards we shall have to put up with their presence, but there are mitigating circumstances. In the East there will be a large majority of other cars; in the West the advertisements will waste their sweetness, largely, on the desert air; as, for instance, in those towns where there is only one family with children of school age, and the Atchison pays \$2,000 a year school tax. And, after all, if the advertisements are got up in good taste, as some advertisements now are, the cars will not be much more offensive to the eye than some of those, long familiar to everybody, which contain only the advertisements of their owners.

LOCOMOTIVE BUILDING.

The Colorado & Northwestern has placed an order with the Brooks Locomotive Works for two consolidation engines.

The Baldwin Locomotive Works have received an order for two mogul locomotives, with 17x24-in. cylinders, from the Louisiana & Northwest Railroad.

The Rutland Railroad will soon place orders for some new locomotives. Six will be required, but we understand that but two, or, possibly, four, will be ordered at present.

The Arkansas Southern, which was recently figuring on ordering one new locomotive, has bought a second-hand engine through Messrs. Fitz-Hugh & Co., Monadnock Bldg., Chicago.

The six new freight locomotives for the Toledo & Ohio Central for which the contract is about to be awarded as we go to press, will be 10 wheel engines with cylinders 18x24 in. and 56 in. drivers, and will weigh about 120,000 lbs. The boilers will be of carbon steel, and of the extended water top type. Detroit lubricators, Ohio injectors, Houston sanding devices, Midvale tires and Jerome metallic packing are specified.

The sample consolidation locomotive ordered last fall by the Cleveland, Cincinnati, Chicago & St. Louis from the Richmond Locomotive & Machine Works was delivered some time ago, and has now been in service several weeks. We are officially informed that the performance of the engine is entirely satisfactory in every respect. It is probable, as noted in this column Nov. 19, 1897, that more engines of this class will be ordered as needed.

The Canada Atlantic has placed an order with the Baldwin Locomotive Works for 16 freight locomotives. Ten will be 10-wheel engines of the Vauclain compound type with 14 and 24x26 in. cylinders, 56 in. (outside diam.) driving wheels, and weigh in working order about 145,000 lbs., with about 116,000 lbs. on the driving wheels. The tender capacity will be 4,000 gals. The remaining six engines will also be Vauclain compounds of the consolidation type, with 15½ and 26x36 in. cylinders and will weigh in working order about 173,000 lbs., with about 156,000 lbs. on the driving wheels. The tender capacity will be 4,500 gals.

The five 12-wheeled simple freight locomotives for which contract was let March 21 by the Chicago, Indianapolis & Louisville to the Brooks Locomotive Works, and previously mentioned in this column, are to be delivered June 1. These engines will have cylinders 21x26 in., fireboxes 120 in. long and 40½ in. wide; weight on drivers, 145,000 lbs., and total weight, 176,000 lbs. Belpaire boilers; working steam pressure 200 lbs. per sq. in. and tank capacity for water of 4,500 gals. The special equipment will include New York air brakes, steel axles, Gollmar bell ringers, Monarch brake beams, Trojan couplers, U. S. Metallic piston and valve rod packing, Consolidated safety valves, Leach sanding devices, Detroit sight-feed lubricators with Tippet devices, and A. French Co.'s springs.

CAR BUILDING.

The Wabash Paper Co. is having five cars built at the works of Barney & Smith.

The Wason Mfg. Co. is building four passenger cars for the Central Railroad of Brazil.

The Ohio Falls Car Mfg. Co. is building 200 freight cars for the Nashville, Chattanooga & St. Louis.

The Delaware, Lackawana & Western has placed an order with the Jackson & Woodin Mfg. Co. for 200 freight cars, with an option on 300 more.

In our issue of March 18 we referred to the Great Northern as contemplating giving a large order for freight cars to Haskell & Barker. It is now reported that an order has been given to build 1,000 cars.

The Pennsylvania Railroad will probably order for its lines East and West of Pittsburgh 2,000 box cars of 80,000 lbs. capacity, some of which may be built at Altoona. The road is also asking proposals on 1,000 steel gondola cars of 100,000 lbs. capacity. No orders have as yet been placed.

The Chicago, Rock Island & Pacific is building at its Horton shops, 85 stock cars of 60,000 lbs. capacity, to be finished this summer. They will be

35 ft. 9 in. long (inside measurement), and be equipped with Diamond trucks, with Schoen bolsters, Bettendorf brake beams, Westinghouse air brakes, Janney couplers, malleable iron journal boxes with pressed steel lids, Columbia graduated springs and Bass chilled cast iron wheels.

The Chesapeake & Ohio on March 23 received bids on 750 hopper bottom gondola and 250 flat bottom gondola cars. They will be of 80,000 lbs. capacity and the former will weigh 33,500 lbs. and be 20 ft. long, 9 ft. wide and 11 ft. 2 in. high. The flat bottom cars will weigh 30,000 lbs. and measure 38 ft. in length, 9 ft. 10 in. in width and 6 ft. 2½ in. in height. All of the cars will have iron axles, Bostinger bolsters, cast iron brake shoes, Westinghouse air brakes, Tower couplers, Butler draft rigging and cast iron M. C. B. journal boxes and journal box lids. The make of brake beams had not been decided at time of going to press.

The Missouri Car & Foundry Co. is building for the Texas & Pacific, 400 box and 100 coal cars to be delivered by July 1. The box cars are to be 60,000 lbs. capacity; length outside of siding, 34 ft. 9½ in.; width outside of siding, 9 ft.; height, from top of rail to top of running board, 12 ft. 8 in. These cars are to be equipped with the American Steel Foundry Co.'s trucks and couplers, Westinghouse air brakes, interchangeable brake beams, Flatau outside car roofs, St. Louis flush doors and cast iron journal boxes. The coal cars are to be 60,000 lbs. capacity, with a length outside of end sills of 34 ft. 8 in.; width, outside of sills, 8 ft. 9½ in.; sides, 42 in. high, and will be equipped with American Steel Foundry Co.'s trucks and couplers, Westinghouse air brakes, interchangeable brake beams and cast iron journal boxes.

The South Covington & Cincinnati street railroad, headquarters Covington, Ky., has given an order to the St. Louis Car Co. for building 20 large open summer cars similar to those now in use on its lines. They will be equipped with Westinghouse motors and electrical appliances, Burrowes curtains and Hunter fenders.

The Metropolitan West Side Elevated, of Chicago, has placed an order for the eight new motor cars mentioned in our issue of March 18 with the Barney & Smith Car Mfg. Co. These motor cars are similar to those previously ordered, and are to have Baldwin trucks and Standard steel-tired wheels, and are to be delivered in 60 days from date of order.

The Twin City Rapid Transit Co., controlling the street railroad systems of Minneapolis and St. Paul, is building a number of cars at its shops in Minneapolis. They were designed and are being built under the direction of W. M. Brown, Master Mechanic. The cars are 43 ft. long and 8 ft. 9 in. wide over all and equipped with trucks of the Bemis pattern. Two cars are about ready to mount and others will be turned out monthly. They will seat 51 people and be used in interurban lines as well as for local travel.

BRIDGE BUILDING.

CAMDEN, N. J.—It is stated that the Board of Freeholders have under consideration the matter of building a new bridge at State St., as the present one is not in good condition.

BLUE RIDGE, ILL.—A steel highway bridge will be built by the Commissioners of Blue Ridge Township, Piatt County.

BOSTON, MASS.—The New York, New Haven & Hartford has filed with the Railroad Commissioners a petition for the approval of the plans submitted for a series of bridges along the present line of location of the Boston & Albany Railroad, from Dartmouth street to the new South Station. The plans provide for the substitution of new bridges at Dartmouth street, Columbus avenue, Tremont and Ferdinand streets, Shawmut avenue, Washington street, Harrison avenue and Village street, in place of those now in use. The plans have been accepted by the Mayor and Board of Aldermen, and are at present on file in the City Engineer's office.

BREAUX BRIDGE, LA.—A steel bridge to cost about \$6,000 will be built at Breaux Bridge by the town.

BUFFALO, N. Y.—Senator Lamy's bill, making an appropriation for a bridge over the canal at Erie St., passed in the Assembly. (Jan. 21, p. 48).

CLARKSVILLE, VA.—The Clarksville Toll Bridge Co. was incorporated to build a bridge. Among those interested are said to be W. H. Russell, W. D. Blanks, C. S. Wood and Robert Harkins.

COLUMBUS, O.—In his estimates for the extension of the water supply system, City Engineer Griggs includes an item of \$3,400 for raising the bridge at Fishingers.

DENVER, COL.—Bids are asked for building the viaduct at 14th St. until April 8. Address N. S. Wood, Pres. (March 4, 1898, p. 167).

EBENSBURY, PA.—Bids are wanted for building an iron or steel bridge at Ashville. Samuel G. Fetterman, County Surveyor, Cambria County.

ELYRIA, O.—A. B. Hayes is one of a committee having under consideration the question of building a steel bridge.

GRAND ECORE, LA.—The Monroe Railway & Construction Co. has been authorized by Congress to build a bridge across Red River at Grand Ecore.

HOWARDSVILLE, VA.—The Howardsville Toll Bridge Co. will build a bridge to cost about \$20,000. This is a company incorporated by J. R. Irving, A. F. H. McCulloch and others.

KANSAS CITY, MO.—The Brooklyn Avenue Ry. Co. is interested in a new steel bridge to be built at a point where its road crosses the Kansas City Belt Railway. (See Electric Railroad Construction Column.)

LANSING, MICH.—It is stated that at an election, to be held April 5, a proposition to build a bridge across Grand River will be voted upon.

LUBEC, ME.—A steel bridge is talked of, to be built in Lubec, Washington County.

MIDDLEBORO, MASS.—It is reported that a bridge will be built in Middleboro, Plymouth County.

MINSTER, O.—The Miami River & Belt Railroad will build a bridge. (See Railroad Construction column.)

MONTGOMERY, ALA.—The bill to authorize the Montgomery & Elmore Bridge & Improvement Co. to build a bridge across the Alabama River near Montgomery passed the United States Senate.

MOUNT VERNON, N. Y.—The State Railroad Commission decided that the bridge by which North 10th avenue of Mount Vernon is to cross the tracks of the New York, New Haven & Hartford must span the entire right of way of the railroad at the point of crossing.

NEW KENSINGTON, PA.—The New Kensington Street Railway Co. will build a bridge. (See Electric Railroad Construction Column.)

NORWICH, ONT.—W. M. Davis, C. E., is preparing plans for a steel bridge over Stover street.

OGLETHORPE, GA.—A county bridge will be built over Flint River at a cost of about \$16,000. A. H. Perry, clerk, Macon County.

ROME, N. Y.—A bill authorizing a new iron bridge over the Erie Canal at South George street, passed the Assembly. The bridge will cost \$16,000.

ROSECRANS, ILL.—A steel bridge will be built over the O'Plain River, east of Rosecrans, Lake County.

ST. JOSEPH, MO.—At a meeting held recently in St. Joseph it was decided by the officers present representing railroads interested to recommend to their respective roads the building of a viaduct. Among those present were: Howard Elliott, Gen. Man. of the Hannibal & St. Joseph; C. M. Rathburn, Supt. of the Central Branch Union Pacific; C. D. Purdon, Asst. Chief Eng. of the Atchison, Topeka & Santa Fe; W. K. McFarlin, Supt. of Maintenance and Construction of the lines east of the Missouri of the Chicago, Rock Island & Pacific; John Donovan, Jr., Gen. Man. of the St. Joseph Stock Yards Co.; L. F. Goodale, Chief Eng. of the Hannibal & St. Joseph; W. T. Van Brunt, Gen. Man. of the St. Joseph Railway, Light, Heat & Power Co., and City Eng. Campbell.

SPRINGFIELD, MO.—Greene County will build two bridges over Sac River to cost about \$4,000 each.

ST. CHARLES, MO.—A bill passed the United States Senate extending for one year the date when work must be commenced on the bridge across the Missouri River at St. Charles.

ST. LOUIS, MO.—Press reports state that the Pittsburgh, Cincinnati, Chicago & St. Louis will change the location of the piers and otherwise remodel the bridge here, to comply with the demands of the War Department.

TAUNTON, MASS.—Messrs. Tucker, Anthony & Co., 53 State St., Boston, can probably give information in regard to a bridge that will be required over Three Mile River, on the Taunton & Providence Street Railway.

UTICA, N. Y.—Mr. Williams' bill, appropriating \$18,000 for a canal bridge, passed the Assembly.

WASHINGTON, D. C.—It is stated that the District Commissioners have ordered the removal of the bridge across Rock Creek, on the Argyle Mill Road, and its substitution by a steel plate girder bridge, to cost about \$2,000.

RAILROAD LAW—RECENT DECISIONS.

In Minnesota on an appeal from a verdict in an action against a street railroad company to recover damages for injuries caused by the alleged negligence of one of its motormen, the Appellate Court, in granting a new trial, decides the following questions, among others: (1) That evidence of general incompetency and habitual carelessness on the part of a motorman, based on the observation of witnesses who had seen him operate his car on occasions prior to the accident, was without relevancy and therefore improperly admitted by the trial court, since the company was not liable except for negligence contemporaneous and connected with the accident; (2) That the rules of the company, intended for the guidance of its employees in the operation of cars, should not have been admitted as evidence upon the trial, since private rules do not limit or define the duty of a railroad company to the public, the standard of obligation being fixed by public law (decided by the Supreme Court, February, 1898).¹

In the same state it is held that, although a railroad company stops its train at a station for a sufficient length of time to enable a passenger to get off without inconvenience, and he neglects to do so, still, if it again stops the train to give him another opportunity to alight, it must be careful to see that he alights safely (decided by the Supreme Court February, 1898).² As to what is sufficient care under the circumstances will usually be a question for the jury. In this case the place offered the plaintiff at which to alight was at a grade sloping gradually for about 3 ft. to the level of the adjacent ground, the top of the grade being about 20 in. below the lowest car step. It was dark, and the plaintiff had an artificial leg, though the servants of the company were not aware of the latter fact. She fell in getting off and a verdict in compensation for injuries received thereby is here affirmed.

In the same state it appeared (in an action brought to recover damages for personal injuries alleged to have been caused by a collision at a railroad crossing) that the plaintiff was with her husband, at his invitation and in his wagon, drawn by his horses, which he was driving at the time of the accident. She had no control over him in the management of the team. It is held that even though her husband failed to look and listen before attempting to cross, and was thereby guilty of such negligence as would defeat an action in his own behalf, her right to recover was not affected by such failure. The court further holds that the question whether she herself was negligent in failing to look and listen, or to observe that her husband was careless in that respect, was properly left to the jury for decision (decided by the Supreme Court, February, 1898).³

A Federal Court holds that the negligence of a father, as the driver of a wagon in which his child (an infant about three months old) was riding, in failing to keep a proper lookout for a train at a railroad crossing, which contributed to a collision in which the child was injured, is not imputable to the child so as to prevent it from recovering damages from the railroad company, which was guilty of neg-

ligence in failing to properly guard the crossing (decided by the Circ. Ct., N. D., Iowa, January, 1898).⁴

A Federal Court holds that the rule requiring a master to furnish his employee with a safe place to work has no application in an action by a servant of a railroad company employed in loading freight into its cars from a wharf, to recover for injuries resulting from the negligent manner in which the freight was piled on the wharf by a connecting carrier, where no defect in the wharf nor in the appliances furnished by the master is alleged. Accordingly a plaintiff injured under these circumstances cannot recover, the danger being as obvious to him as to the defendant (decided by the Circuit Court, N. D. California, December, 1897).⁵

A Federal Court holds that any one, acting under authority by an ordinance of a City Council cannot be restrained, at the suit of the owner of an abutting property, from constructing in a public street a private track, subject to municipal control, and connecting with the line of a railroad, as the validity of the ordinance granting the right can only be attacked by an officer acting in the name of the people of the state, or by an application for an injunction brought by the city (decided by the C. C. A. January, 1898).⁶

On the trial, in Arkansas, of an action against a railroad company, the court charged the jury that a railroad company is liable to pay damages, notwithstanding the contributory negligence of an injured plaintiff, provided the injury was caused by the failure of the defendant to use proper care after it had become aware, or "by the exercise of reasonable diligence might have become aware" of such contributory negligence. This instruction is held to have been such serious error as to entitle the defendant company to a new trial, since contributory negligence on the part of a plaintiff is always a good defense if proved, notwithstanding the negligence of the defendant (decided by the Supreme Court, January, 1898).⁷ The court by its dictum calls attention to the fact that the Arkansas statute making a railroad liable for all damages resulting from neglect to keep a constant lookout on its trains for persons or property on the track, does not preclude the defense of contributory negligence.

It is held in Kentucky that a deed conveying a right of way to a railroad company, which provides that, if the company ceases to use the right of way as a railroad, it is to revert to the grantor, implies an obligation on the part of the company to construct the road within a reasonable time, and therefore the right is forfeited to the grantor by unreasonable delay, in this case thirty-four years (decided by the Court of Appeals, January, 1898).⁸

It is held in Texas that suffering from cold by reason of the failure of a railroad company to deliver clothing, in connection with the indigence of the plaintiff, and his consequent inability to buy other clothing, is not to be considered in fixing the amount of damages for such failure, as it is not the natural result of a breach of the contract of shipment (decided by the Court of Appeals, January, 1898).⁹

1. Fonda vs. St. P. City R., 74 N. W., 166.
2. Kral vs. B., C. R. & N., 74 N. W., 166.
3. Inev vs. C. M. & St. P., 74 N. W., 174.
4. Kowalski vs. Chi. G. W., 34 Fed., 586.
5. Carolan vs. Southern Pac., 84 Fed., 84.
6. Coffeen vs. C. M. St. P., 84 Fed., 46.
7. L. R. & Ft. S. vs. Smith, 43 S. W., 368.
8. Pollock vs. Maysville & B. S., 44 S. W., 359.
9. St. L., S. W. of Texas vs. May et al., 44 S. W., 408.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Chicago, Rock Island & Pacific.—Quarterly, 1 per cent., payable May 2.
Cincinnati, Hamilton & Dayton.—Preferred, A & B, quarterly, 1 per cent., payable April 5.
Dayton & Michigan.—Common, guaranteed, 1½ per cent., payable April 1; preferred, quarterly, guaranteed, 2 per cent., payable April 5.
Delaware, Lackawanna & Western.—Quarterly, 1½ per cent., payable April 20.
Keokuk & Western.—One per cent., payable April 1.
Rio Grande Western.—Preferred, quarterly ¾ per cent., payable May 1.
Southwest Pennsylvania.—Five per cent., payable April 1.
Utica & Black River.—Semi-annual, 3½ per cent., payable March 30.
Cleveland Electric.—Quarterly ¾ per cent., payable April 5.
Interstate Consolidated, North Attleborough, Mass.—Quarterly 1½ per cent., payable April 1.
Louisville (Ky.) Railway.—Common, 1¼; preferred, 2½ per cent., payable April 1.
Metropolitan, N. Y.—Quarterly 1¼ per cent., payable April 15.
National (St. Louis) Railway.—Quarterly 1½ per cent., payable April 9.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:
American Railway Association.—Galt House, Louisville, April 6.
American Society of Civil Engineers.—Meets at the house of the society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month at 8 p. m.
Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.
Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7.30 p. m.
Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.
Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.
Chicago Electrical Association.—Meets at Room 7,137, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, secretary.
Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.
Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.
Denver Society of Civil Engineers.—Meets at 3 Jacob-

son Block, Denver, Col., on the second Tuesday of each month except during July and August.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Thursday of each month, excepting July and August, at 7.30 p. m.

Engineers' Club of Columbus (O.).—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month at 7.30 p. m.

Locomotive Foreman's Club.—Meets every second Tuesday in the clubroom of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Master Car Builders' Association.—Saratoga Springs, N. Y., Wednesday, June 8.

Master Mechanics' Association.—Saratoga Springs, N. Y., Monday, June 13.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7.30 p. m.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month at 8 p. m.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is secretary.

Western Railway Club.—Meets in Chicago on the third Tuesday of each month at 2 p. m.

Western Society of Engineers.—Meets in its rooms on the first Wednesday of each month at 8 p. m., to hear reports and for the reading and discussion of papers. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago.

The Engineers' Club of Philadelphia.

A regular meeting of the club will be held on Saturday, April 2. Paper, "The Engineering Chemistry of Boiler Waters," by Henry Leffmann. A conversational meeting has been arranged for Saturday, April 9. Among the subjects that will be presented will be an illustrated talk on "A Trip to Greenland," by Dr. Henry E. Wetherill, surgeon to the Peary Relief Expedition. Dr. Wetherill will also exhibit several compact scientific instruments, devised especially for exploration purposes. The meeting will begin about 8 p. m.

British Iron and Steel Institute.

The annual meeting of the Iron and Steel Institute will be held at the Institution of Civil Engineers, Great George street, London, on Thursday and Friday, May 5 and 6, 1898. A detailed programme will be issued in due course. The annual dinner of the Institute will be held on May 5 in the Grand Hall of the Hotel Cecil. The autumn meeting of the Institute will be held at Stockholm under the auspices of the Swedish Association of Ironmasters on Friday and Saturday, Aug. 26 and 27, 1898. Excursions to places of interest in the vicinity of Stockholm will be arranged; but there will be no official visit to the ironworks and mines. It is anticipated, however, that a limited number of members will receive personal invitations to visit, before the meeting, the iron mines of the Arctic Circle, and, after the meeting, the ironworks and mines of Central Sweden.

Engineers' Club of Cincinnati.

At the February meeting of the club Mr. Wm. C. Jewett read a paper on "The Construction of a Temporary Railroad and the Arching of Tunnel No. 17 on the Cincinnati Southern Railway." On Feb. 16, 1889, the timber lining in this tunnel was set on fire from the result of a collision. As some days must elapse even before the tunnel could be entered it was determined to build a temporary line over the mountain; and it was also decided that it would be a good time to arch the tunnel with brick lining. Within 36 hours after the occurrence of the accident a corps of engineers was on the ground locating the line, and in three days men and materials had been collected and construction commenced. In six days from the time of the accident the track was completed and trains in operation over the new line. The work accomplished consisted of the following:

3,352 cu. yds. earth excavation.
3,090 cu. yds. loose rock excavation.
2,168 cu. yds. solid rock excavation.
875 lin. ft. cribbing and frame trestle from 0 to 20 ft. high, and laying, surfacing and ballasting 4,940 lin. ft. of track.

The grades were 4.8 per cent. and 5.0 per cent., respectively, on the south and north ends, with maximum of 9 deg. curves. Trains were operated over this track for 4½ months, during which time the tunnel was cleaned out and arched. (See Railroad Gazette, 1889, p. 193, for profiles, etc.)

Northwestern Electrical Association.

The special committee appointed for the purpose has unanimously resolved to accept the invitation of the cities of Duluth and Superior to visit those cities next June, and Mr. J. M. Hill of Chicago was authorized to arrange with any steamboat company for a summer meeting of the Association to be held en route from Chicago, via Sault Ste. Marie, Hancock and Houghton, to Duluth. This plan includes a lake trip, probably by the steamer Manitou, from Chicago to Duluth, returning by rail. The time required for the trip, including two days at Duluth and Superior, would be between five and six days. The proposition is to hold this convention immediately after that of the National Electric Light Association at Chicago June 7-9, in the hope that members of that association would make the lake trip to Duluth. The plan is to leave Chicago Saturday, June 11, reach Mackinac Island early on the 12th, and Sault Ste. Marie about noon; to stop at the latter place to inspect the ship canal and to leave the evening of the 12th, arriving at Hancock Monday morning the 13th. At Hancock a visit to the Calumet and Hecla mines has been arranged for, the ladies of the party being entertained at Hancock and Houghton. The party will leave Hancock early enough on Monday to reach Duluth that night. The expenses of the trip, including steamer, meals, stateroom, hotels at Duluth and Superior and railroad, sleeping and dining car fares returning, is estimated by the committee at not over \$43, based on propositions from the steamship company and reduced rates promised by hotels at Duluth and Superior and a one-third rate by rail from Duluth to Chicago. J. M. Hill, W. W. Low and F. E. Donohue of Chicago have been appointed a committee of arrangements for entertainment of delegates.

PERSONAL.

—Mr. John A. Warner, Traveling Accountant of the Texas & Pacific, with office in Dallas, Tex., died at St. Louis, Mo., March 21.

—Mr. C. R. Davidson, formerly Secretary of the St. Paul & Minneapolis Passenger Association, with office at St. Paul, has been appointed Secretary of the Kansas City Passenger Association, succeeding Robert E. Glenn. No successor has as yet been appointed to Mr. Davidson.

—Mr. Joseph de Gurse, Chief Engineer of the Lake Erie & Detroit River Railway, with office at Windsor, Ont., died at that place March 22, at the age of 41. Mr. de Gurse entered railroad service in 1887, as Chief Engineer of the Lake Erie & Detroit River Railway, and held that position until his death.

—Mr. William J. Howard died at his home in Philadelphia, March 19, at the age of 71. He was Assistant Secretary of the Pennsylvania in 1863, and was elected General Solicitor May 3, 1869. As such he had general oversight of all legal business of the Pennsylvania. He remained as General Solicitor until Oct. 10, 1877, when he resigned.

—Mr. Rendy Cressman Edwards, District Superintendent of the Pullman Palace Car Co., with office in Richmond, Va., died suddenly in Washington, D. C., March 17. Mr. Edwards was born in Philadelphia, Pa., in 1858. He entered the service of the Pullman Palace Car Co. in 1888, and was appointed District Superintendent March 1, 1894.

—Mr. Axel L. von Weissenberg, M. E., of the Finland State Railways, sailed for Liverpool, on his way to Finland, on the Campania, March 26. Mr. von Weissenberg has been in this country for the past two and a half months, his time having been occupied principally in inspecting the twenty-two engines just finished by the Baldwin Locomotive Works for the Finland State Railways.

—Mr. Edward W. Braisted, Joint Agent, St. Louis Eastbound Traffic Association, with office in St. Louis, Mo., died at that place March 24, at the age of 45. Mr. Braisted was born in Rahway, N. J., May 23, 1853, and entered railroad service in 1879 with the Chicago & Alton. He was Secretary and Chairman of the St. Louis Freight Committee, and was appointed Joint Agent of the St. Louis Eastbound Traffic Association in May, 1891.

—Mr. Charles Barstow Wright, former President of the Northern Pacific, died at his residence in Philadelphia, Pa., March 23, at the age of 76. Mr. Wright was born in Wyoming Valley, Bradford Co., Pa., Jan. 8, 1822. At the age of 15 he began work in Erie, Pa., in a bank. He became interested in Western lands, and organized the Tacoma Land Co. and opened an office in Philadelphia. In the early sixties Mr. Wright engaged in the development of petroleum interests in Pennsylvania. He was a Director of the Oil Creek & Allegheny River Railroad, now the Western New York & Pennsylvania, from 1870 to 1874. For several years previous to 1871 he was connected with the Philadelphia & Erie. In 1871 he became a Director of the Northern Pacific and was made Resident Vice-President in 1873, his official residence being in New York, and remained as such until 1876, when he became President, succeeding George W. Cass. He resigned the Presidency on account of failing health May 24, 1879, but remained as a Director until 1893. Mr. Wright purchased the Oregon & Washington Territory Railroad under foreclosure April 20, 1892, and transferred it to the Washington & Columbia River, chartered in that year and of which he was the chief owner. He was for many years a banker in Philadelphia and a member of the Philadelphia Stock Exchange.

—Mr. H. Walter Webb, who has been for nearly eight years Third Vice-President of the New York Central & Hudson River Railroad, has resigned on account of ill health. This is an event which has been expected for some months, as it was obvious that Mr. Webb's health was in a very precarious condition and doubtful if it could be restored so long as he remained in active work. Mr. Webb entered railroad service in 1886 as Vice-President of the Wagner Palace Car Company. In 1889 he became Assistant to the President of the New York Central, and in 1890 was made Third Vice-President, the office being created for him. The Third Vice-President has charge of construction, maintenance and operation of the system. A part of the redistribution of duties which took place at the same time was the creation of the office of General Manager, to which Mr. Toucey was promoted from General Superintendent, and, of course, as General Manager, he reported directly

to the Third Vice-President. Mr. Webb's administration was speedily marked by enterprise and energy, and under him the New York Central has come to be one of the most advanced, as well as one of the most famous railroads in the world, as regards its passenger service. In number and speed of trains, and in their comfort and luxury and punctuality, in all the elements which go to make up public accommodation and in provision for safety, the improvement during the years of his administration has been very great. Of course, we do not pretend to attribute all this to Mr. Webb; his veteran General Manager has counted for a good deal in the change, as have other officers. But as Mr. Webb has been the responsible head of that department, so he must, of course, receive much of the credit for what has come about under his administration. We have not yet learned who will succeed Mr. Webb; possibly the office will lapse, and very likely no decision will be announced till April 20, the day of the annual election.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—George T. Nicholson, General Passenger and Ticket Agent of the St. Louis & San Francisco, with office at St. Louis, Mo., has been appointed Passenger Traffic Manager of the Atchison, Topeka & Santa Fe, succeeding the late William F. White. (March 25, p. 223.) Until a few months ago Mr. Nicholson was General Passenger Agent of the Atchison, Topeka & Santa Fe at Chicago. The appointment is effective May 1.

Austin & Northwestern.—At the annual meeting of this company, which is controlled by the Southern Pacific, held in Austin, Tex., March 17, W. R. Hamby was elected director.

Beech Creek.—George S. Prince, Assistant Treasurer of the New York Central & Hudson River, with office in New York City has been appointed Secretary of the Beech Creek, which is leased to the New York Central & Hudson River; and also Secretary and Treasurer of the Clearfield Bituminous Coal Corporation, to fill the vacancies caused by the death of Allyn Cox. (March 25, p. 223.)

Charleston & Western Carolina.—George T. Bryan has been appointed General Agent at Atlanta, Ga., succeeding J. E. Crossland, Jr., resigned.

Chicago, Milwaukee & St. Paul.—W. G. Collins, General Superintendent, with headquarters in Chicago, Ill., has been appointed General Manager, succeeding A. J. Earling, who remains as Second Vice-President. H. R. Williams, Assistant General Superintendent, now located in Minneapolis, Minn., has been appointed General Superintendent, succeeding Mr. Collins. W. J. Underwood succeeds Mr. Williams as Assistant General Superintendent at Minneapolis. D. L. Bush, now Division Superintendent at St. Paul, Minn., has been appointed as Assistant Superintendent at Milwaukee succeeding Mr. Underwood. Mr. Earling is not at present to become a member of the Board of Directors, as reported. Effective April 1. W. S. Bratt, formerly Commercial Agent at Grand Rapids, Mich., has been appointed Division Freight and Passenger Agent, with headquarters at Mason City, Ia.

Chicago, Rock Island & Pacific.—C. H. Caswell, Commercial Agent at New Orleans, La., has been appointed Commercial Agent at St. Louis, Mo., succeeding H. J. McNeal, transferred.

Cleveland, Akron & Columbus.—J. J. Lyon, Traveling Auditor, has been appointed Secretary and Auditor, to fill the vacancy caused by the death of S. Y. McNair. His office is at Cleveland, O. (March 25, p. 223.)

Cleveland, Cincinnati, Chicago & St. Louis.—George Ward, heretofore Traveling Passenger Agent of the Michigan Division, has been appointed Northwestern Freight Agent, with headquarters at Detroit, Mich. He has been succeeded by S. E. Thomas.

Colorado & Northwestern.—Samuel D. Hum has been appointed Auditor, with headquarters at Boulder, Colo.

Corvallis & Eastern.—C. H. Curtis is Treasurer, with office at Albany, Ore. (March 11, p. 187.)

Florida East Coast.—R. W. Parsons, heretofore Assistant to the President, has been appointed Manager of the Miami & Nassau Line, in charge of operation and passenger traffic, with headquarters at Miami, Fla.

Illinois Central.—J. B. Kemp, Division Superintendent at Memphis, Tenn., has been transferred to Aberdeen, Miss., as Superintendent of the Memphis Division.

Intercolonial.—F. R. F. Brown, Mechanical Superintendent, with office at Moncton, N. B., has resigned.

Iowa Central.—Robert McMains has been appointed Traveling Engineer, with office at Marshalltown, Ia.

Lake Shore & Michigan Southern.—W. T. Andrews has been appointed Commercial Agent, with office at Pittsburgh, Pa., succeeding H. J. Lawrence, General Agent.

Lehigh Valley.—Charles A. Parker, Eastern Traveling Passenger Agent, with headquarters in New York City, has been appointed Northwestern Passenger Agent, with headquarters in Chicago, succeeding James A. S. Reed. The appointment is effective April 1.

Mexican National.—W. W. Appler has been appointed Traveling Freight and Passenger Agent, with headquarters at Chicago, Ill., succeeding H. J. Falkenback, recently promoted. (Feb. 11, p. 109.)

New York Central & Hudson River.—On last Saturday the resignation was announced of Mr. H. Walter Webb, Third Vice-President, because of ill health. (See the personal column.)

New York, Chicago & St. Louis.—At a meeting of the directors, held in New York March 23, Charles F. Cox was appointed Treasurer and Secretary, succeeding the late Allyn Cox, with office in New York City. Frederick Middlebrook has been appointed Treasurer for New York, with office at the

Grand Central Station. J. H. Grant, heretofore Contracting Agent at Buffalo, N. Y., has been appointed Commercial Agent at the same place.

Omaha, Kansas City & Eastern.—George M. Enriken, recently resigned, has returned to his former position as Assistant General Freight Agent, with office at Omaha, Neb. D. K. Torrey, formerly Traveling Freight Agent of the Kansas City, Pittsburgh & Gulf at Maryville, Mo., has been appointed Private Secretary to W. A. Williams, recently appointed Superintendent of the Northern Division, with headquarters at Omaha.

Oregon Short Line.—W. J. Tollerton, Division Foreman of the Utah Division at Salt Lake City, has been appointed Master Mechanic, with headquarters at the same place. D. J. Malone, Division Foreman of the Montana Division at Pocatello, Idaho, has been appointed Master Mechanic, with headquarters at the same place. These are new offices.

Philadelphia & Reading.—J. H. M. Claggett, formerly Sales Agent, with office in Buffalo, N. Y., has been appointed Resident Manager of the Philadelphia & Reading Coal & Iron Co., with office in Chicago, Ill., succeeding E. B. Crosley, transferred. D. L. Tuttle has been appointed Sales Agent with office in Buffalo, succeeding Mr. Claggett.

Pittsburgh, Bessemer & Lake Erie.—Homer E. Smith has been appointed Freight Accountant, with headquarters at Cleveland, O.

Plant System.—H. C. Prince, formerly Traveling Auditor of the Louisville & Nashville, has been appointed Acting Comptroller of the Plant System, with headquarters at Savannah, Ga.

Sierra Railway of California.—The offices of the following officials have been transferred from Oakdale, Cal., to Johnstown: Vice-President and Treasurer S. D. Freshman, Auditor R. M. Peck, Superintendent W. G. Potts, General Freight and Passenger Agent D. T. Booze.

Wabash.—James Bruce has been appointed Superintendent of Terminals, with office in Dearborn Station, Chicago. He will have charge of tracks and property in Chicago to and including Clarkdale Junction on the St. Louis line, and Clarke Junction on the Detroit line. Appointment is effective April 1.

Winona & Western.—S. S. Strause has been appointed Assistant Treasurer, succeeding H. S. Johnson, resigned. His office is at Winona, Minn.

RAILROAD CONSTRUCTION. Incorporations, Surveys, Etc.

ALASKA ROADS.—The Alaska Railroad was incorporated in New Jersey, March 29, with a capital stock of \$1,000,000 to build a line from some point on Lynn Canal in Alaska, northwest to Fort Selkirk in the Dominion of Canada, and to operate a line of steamers on the Pacific Ocean between Alaska and points in the United States. The incorporators are: Clinton W. Sweet of New York, Joel Francis Freeman, East Orange, N. J.; Henry Desmond, Crawford, N. Y.

ALBERENE.—Grading is reported to have been completed on this line from Bowling Springs, Va., to Alberene, 10 miles. Pitts & Downin of Scottsville, Pa., have been awarded the contract. R. E. Shaw is Chief Engineer.

ALMAGORDA & SACRAMENTO MOUNTAIN.—This company was incorporated in New Mexico, March 25, with a capital stock of \$900,000, to build a line from Almagorda, a point on the new line of the El Paso & Northeastern, to run east about 20 miles to the Sacramento Mountains with two branches, which, with the main line, aggregate 75 miles. The incorporators who are interested in the El Paso & Northeastern are as follows: J. A. Eddy, H. A. Conner, J. L. Campbell, El Paso, Texas; W. A. Hawkins and A. S. Greig. The headquarters will be in Hueco, Donna Ana Co., N. M.

ASTORIA & COLUMBIA RIVER.—Grading is completed and only 11 miles of rails are yet to be laid, according to report, on this line from Astoria, Or., along the southern bank of the Columbia River to Goble, a point on the Northern Pacific, 60.3 miles. (Feb. 11, p. 110.)

BRECKENRIDGE, DILLON & NORTHERN.—Grading has been completed, according to report, from Breckenridge to Dillon, and the right of way obtained on this proposed line from Breckenridge north down the valley of the Blue River and along the Cores and Park Mountain ranges to Steamboat Springs and Hahn's Peak. Robert F. Foote of Breckenridge is among the directors. (March 11, p. 187.)

BUFFALO, ROCHESTER & PITTSBURGH.—A. E. Patton of Curwensville, Pa., who has the contract for building the first 12 miles of the Allegheny & Western extension from Punxsutawney, Pa., west 98 miles to New Castle, has sublet contracts as follows: McAtee & Reed, the first three miles; M. J. Miniman, two miles; Col. Reynolds, two miles; Bennett & Talbot of Greensburg, the tunnel 2,300 ft. long and also the approaches including two miles of grade. Contractor Brewer of South Bethlehem, Pa., gets the balance. The Curwensville Contracting Co., of which Mr. Patton is President, will do the stone work. Work was begun March 21. (March 25, p. 224.)

CALIFORNIA NORTHWESTERN.—This company has been incorporated to build an extension of the San Francisco & Northern Pacific into the Redwood forests of Mendocino and Humboldt counties, Cal. It is stated that a close traffic agreement has been made with the San Francisco & Northern Pacific for hauling cars down to the San Francisco Bay for connection with Eastern points.

CANE BELT.—Official statement is received that this company was chartered in Texas to build a line from Eagle Lake, Colorado County, south 16 miles to Bonus, Wharton County, on the Southern Pacific. Surveys are completed, construction is under way, and one mile of track is built. The Colorado Construction Co., of which W. T. Eldridge is President, holds the contract. There are 25 men at work. The line is to extend over a comparatively level country, with few cuts and grades. W. T. Eldridge, of Eagle Lake, Tex., is Vice-President and General Manager. (Mar. 18, p. 208.)

CHICAGO & NORTHWESTERN.—Official statement is received that work is well under way on the second track of the main line from Barrington, Ill., to Harvard, 31.29 miles, and from Evanston, Ill., to Madison, Wis., 22.67 miles. The contracts for this work were let last fall to D. D. Streeter & Co., of Chicago, Ill. It is the intention of the company to complete the work this year. (Oct. 29, 1897, p. 774.)

Engineers are reported to be making surveys for a cut-off from Des Moines, Ia., north to Ames. The present line has many curves.

CHICAGO, ROCK ISLAND & PACIFIC.—Official statement is received that survey is made and nearly all cross-sectioned for the Chicago, Rock Island & Texas extension from Bridgeport, Tex., west 28 miles to Jacksboro. John P. Hughes, of Fort Worth, is already on the work. Bethune & Craney Bros. are moving their outfit on to the line. John J. Fox, of Alma, Kan., is doing the stone work. The maximum grade will be 1 per cent., and the maximum curve 3 degrees. (Mar. 25, p. 224.)

The company has not decided to build an extension west from either El Reno, Okla. Ter., or from Chickasha, I. T. The matter is under consideration, but nothing has been determined upon, and it is not likely to be for some weeks, or possibly months.

DENISON, BONHAM & NEW ORLEANS.—The House of Representatives has passed the bill granting right of way through Indian Territory to this company. It was chartered in 1887 to build a line from New Orleans, La., northwest through Shreveport, La., and Bonham, Texas, to Denison. Grading was completed from Denison to Bonham in 1888, but no rails were laid. In 1890 the charter was amended so as to extend the road north to connect with the Missouri Pacific at a point on the Red River in Indian Territory. (Feb. 10, 1888, p. 97; March 23, 1888, p. 196; June 27, 1890, p. 467.)

DETROIT & LIMA NORTHERN.—The new line from Dundee, Mich., to Detroit is reported to be in operation, and contracts have been made with the Michigan Alkali Co. and other like corporations in the vicinity of Detroit which will guarantee the Detroit & Lima Northern 30,000 cars of freight per annum, and the company has laid about 15 miles of side track to reach these industries. The line of the Columbus Northwestern extends from St. Johns, O., to Marysville, and is said to be so far completed that operation will begin early in the spring. (March 18, p. 188.)

EL PASO & NORTHEASTERN.—Forty miles of this line is reported to have been laid with track from El Paso, Tex., northeast 165 miles through New Mexico to White Oak. The New Mexico Railway & Coal Co. of 66 Broadway, New York, has the general contract. (Jan. 21, p. 50.)

EL RENO & SOUTHWESTERN.—Senator Harris of Kansas has introduced a bill into the Senate granting right of way to this company through the Indian Territory. The company was incorporated in Oklahoma Territory, Feb. 5, to build a line from El Reno southwest to a point on the Fort Worth & Denver City Railroad at or near Vernon, Tex. (Feb. 11, p. 110.)

FITZGERALD & ATLANTIC.—This company was incorporated in Georgia, March 21, with a capital stock of \$40,000, to build a line from Fitzgerald, a point on the Georgia and Alabama, southeast about forty miles to Nicholls, the terminus of the Waycross Air Line. (See below.) The incorporators are: P. H. Fitzgerald, of Indiana; G. W. Smith, Thomas Wilson, Eli Nicholson, J. B. Sauer, B. W. Fitch, W. B. Moore, T. W. Hayde, C. W. Wise, J. G. Knapp, W. R. Bowen, D. Holmes, C. R. McLeod, H. G. Taylor, C. A. Renard, D. C. Welch and Mr. Buice, all of Irwin County, Georgia.

GOSHEN.—This company was incorporated in New York, March 24, with a capital stock of \$300,000, to build a cut off 2 1/2 miles long from a point on the Erie in the village of Goshen to a point on the same company's line east of Goshen Station. The Directors, who are for the most part high officials of the Erie, are as follows: E. B. Thomas, C. W. Buckholz, John A. A. Middleton, G. M. Cummings, O. M. F. Merrill, George B. Sownell and Edward White, of New York; J. B. McCullough, of Bennington, Vt., and C. R. Fitch, of Paterson, N. J.

GULF, COLORADO & SANTA FE.—The Senate has passed the House bill granting this company right to construct a branch in Indian Territory. This branch is to be built eastward from the main line at Daugherty. (Feb. 4, p. 88.)

ILLINOIS CENTRAL.—With reference to the report that citizens of Dixon, Ky., are endeavoring to induce the Illinois Central to extend its line to Dixon, Charles Dorris of the Dixon Bank writes that if the proposed road is to be built it will be by the Illinois Central. The road will be from Sullivan, Ky., or Blochford, on the Illinois Central by way of Clay and Lisman to Dixon, about 18 miles. The country is level and no bridges will be required. The proposition is before the railroad company, but there is nothing definite as yet.

IOWA CENTRAL.—The report that this company is to build a branch during the coming summer from Oskaloosa, Ia., northwest about 25 miles to Des Moines is officially declared to be untrue. (Mar. 18, p. 208.)

JONESBORO, LAKE CITY & EASTERN.—Official statement is received that the Lake City & Luxoria, which was incorporated in Arkansas about Nov. 1, with a capital stock of \$245,000, is intended to form part of the Jonesboro, Lake City & Eastern, the charter being taken out by stockholders of that company. The Jonesboro, Lake City & Eastern is making a survey to extend its line to Luxoria on the Mississippi River. The line now extends from Nettleton, Ark., east 12.2 miles to Lake City and 2 miles more are under construction. A. J. Kerfoot of Jonesboro, Ark., is General Manager. (Jan. 21, p. 50.)

KANSAS & SOUTHEASTERN.—About 100 teams and 200 men are reported at work on this new line from Hunnewell, Kan., southwest through Parker, Okla. Ter., to Kay Center. Among those interested is Francis S. Eaton of Arkansas City, Kan. (Feb. 11, p. 110.)

KANSAS CITY, FORT SCOTT AND MEMPHIS.—This company is reported to have begun work on

terminal improvements at Rosedale, Kan., where earth is being removed to form a bed for twelve spurs of track. The company is also said to purpose building sheds and round houses at that place.

KEOKUK & WESTERN.—Officials of this road are reported to have made propositions to the people of Decatur, and Eaglesville, Ia., and Bethany, Mo., to make the proposed extension to Pattonsburg, Mo., from Decatur down the old survey through those towns, instead of from Cainsville, Mo. The condition is that the road should receive the right of way. (March 25, p. 224.)

KETTLE VALLEY.—This company was incorporated in the State of Washington March 19 with a capital stock of \$1,000,000 to build the proposed branch of the Spokane Falls & Northern through the Colville Indian Reservation to the international boundary, where it is to be extended up the Valley of the Kettle River to Greenwood City, Austin Corbin and E. J. Roberts are named as incorporators. Senator Wilson has introduced a bill into the Senate to grant right of way through the Indian Reservation. The bill has been referred to the Committee on Indian Affairs. (Spokane Falls & Northern, March 25, p. 225.)

LAKE ERIE & WESTERN.—Announcement is made that the contracts for the extension of this line from Akron, O., east to New Castle, 85 miles, will be let before April 15. (Feb. 25, p. 148.)

LOUISIANA & ARKANSAS.—This company was incorporated in Arkansas, March 21, with a capital stock of \$150,000, to build a line from a point on the St. Louis Southwestern at or near Stamps, Ark., south about 40 miles to Cotton Valley, Webster Co., La. This is apparently an incorporation of a road of the same name which is in operation from Stamps to Coyle, La., 23 miles. The incorporators are: William Buchanan, William T. Ferguson, of Texarkana, Tex.; J. A. Buchanan, W. C. Brown, T. A. Brown, J. C. Ferguson, M. Northcott and Robert Buchanan, of Stamps, Ark.

MEXICAN ROADS.—The concession to H. V. R. Reed of London and Alfred Bishop Mason of New York, referred to in this column for last week, is not for the extension of the Mexican Southern southeast from Oaxaca, Mex., to Tehuantepec. That was the old concession which has been replaced by a new one granted March 15. By the new concession a line is to start from a point on the Mexican Railroad in Vera Cruz between Cordoba and Paso del Macho, thence running southeast through that state to a point on the National Tehuantepec Railroad between Santa Lucracia and Ojapa with a branch connecting the main line from some point north of the Papaloapam River with the port of Vera Cruz. By the terms of the concession 100 km. (62 miles) must be completed within two years; 100 km. more within three years, and the entire line and branch within four and a half years. The Government agrees to pay \$16,000 for each kilometer of main line and \$8,000 per kilometer of the branch line with the proviso that the entire concession shall not exceed \$6,000,000. The company may build such other branches as are desired but without subsidy, provided the routes be made known prior to the limit of time allowed for the completion of the line. (March 25, p. 225.)

The Government has recently made another concession to Senor Ignacio Borda of Mexico City for a standard gage road from Guadalajara on the Mexican Central, in the state of Salisco, running south about 150 miles to Colima, where connection will be made with the Mexican National Construction Co.'s line in the state of Jalisco, which runs to Manzanilla on the Pacific Coast. American capitalists have taken the project in hand. Gregorio Najas, a capitalist of Mexico City, has gone to Chicago to organize a company to build the road.

MIAMI RIVER & BELT.—Official statement is received that the charter of this road has been altered to make it possible to build the line from Minster, O., to Piqua before building into Sidney and thence southeast to connect with the new Columbus & Northwestern line of the Detroit & Lima Northern. Surveys for this part of the line have been completed, and it is expected that grading will be completed May 1. It will take until that time for the right of way to dry out in fit shape for working. No contracts have as yet been let. The company will handle its own work and sublet parts of it. There is but one bridge of importance on the line between Minster and Piqua, which will be of steel. This company was incorporated in Ohio in January to build a belt line through the counties of Auglaize, Logan, Shelby and Miami. A. T. Welles, 215 Dearborn street, Chicago, Ill., is First Vice-President. (Jan. 28, p. 71.)

MISCELLANEOUS COMPANIES.—The Pacific Coast Improvement Co. was incorporated in Washington State, March 16, with a capital stock of \$500,000, the object being to acquire, deal in and operate mines, mills, real estate, stocks, bonds, steam and sailing vessels, electric plants, water power, railroads, etc. The incorporators are: William Bailey, 66 Broadway, New York; Ira A. Town and E. J. Dorr, officials of the Tacoma & Columbia River Railroad; Alexander Tinling, General Agent of the Northern Pacific, and C. W. Thompson.

MISSISSIPPI RIVER, HAMBURG & WESTERN.—Work is being rapidly pushed, according to report, on this line from Hamburg, Ark., east 46 miles to Cone City, on the Mississippi River, and track is now laid on a portion of the line.

MONROE RAILWAY & CONSTRUCTION CO.—At a recent meeting of the directors, Chief Engineer Sylvester reported that the line could be built for \$1,000,000. The distance will be 89 miles, extending from Monroe, La., southwest via Winnfield to Natchitoches. The road is to traverse an agricultural, mineral and timber country. It is estimated that 2,000,000 ft. of long leaf pine are accessible. R. A. Shotwell of Monroe is among those interested.

MOSCOW & EASTERN.—A contract has been signed, according to report, for \$500,000 of bonds to build this road from Moscow, Idaho, east 40 miles to the main stream of the Potlache River. George Creighton is President, and C. O. Brown General Manager, both of Moscow, Idaho. (Feb. 18, p. 130.)

NASHVILLE & KNOXVILLE.—Surveys are being made, according to report, for an extension of this line from Monterey, Tenn., east about 40 miles to Glen Mary, on the Chicago, New Orleans & Texas Pacific. (Oct. 15, 1897, p. 737.)

line will be of the side pole construction using an iron pole. The overhead material will be of the standard Ohio Brass Co.'s manufacture. Where the road crosses the K. C. Belt Ry., a new steel bridge will take the place of the present structure. The company is undecided whether they will put in the generating plant at their present station, Tenth and Euclid, or build a new station on the Blue River, where they can get water for condensing, and run in the five miles with alternating current. For the present generators will be installed at the old station. The company plans to make a ten mile extension in the fall out southeast to the Brush Creek coal regions.

KUNKLETOWN, PA.—The Chestnut Ridge Railroad Co. has been chartered to build a road from Lehigh Gap to Kunkletown, Monroe County, 10½ miles. The capital stock is \$105,000. Among the incorporators are James F. Pearsol and W. W. Booth, Kunkletown.

LOS ANGELES, CAL.—The San Gabriel Traction Co. is reported organized with a capital of \$1,000,000, of which about \$25,000 is paid in. The directors are Albert Hadley, B. W. Lee, W. S. Maxwell, of Los Angeles, and James S. Graham, of Chicago, Ill. It is proposed to build to Duarte by way of Pasadena.

LOS GATOS, CAL.—Mr. E. N. Davis is said to be promoting a plan for a trolley road to San Jose.

MILTON, MASS.—Press reports state that the Boston, Milton & Randolph Street Railway Co. has been granted rights on Randolph street. (Nov. 12, 1897, p. 807.)

NANTASKET, MASS.—It has been reported that the New York, New Haven & Hartford Railroad Co. will extend the Nantasket Beach electric equipment from East Weymouth to Braintree. There is talk of this, but it is not definitely arranged. New rails are now being laid and these are drilled for electric bonding, and it may be that the company will shortly decide to put on electric equipment, which could be easily done, taking power from the power house at Nantasket. On the other hand, this change may not be made at all this summer. It includes several complications. Steam service would have to be operated over the same line, and there is a question as to the best accommodation for the messengers until the electric service is still further extended. In brief, the subject of extension is under discussion, but nothing definite has been decided.

NEWARK, N. J.—The Consolidated Traction Co. of New Jersey is attempting to secure the right of way in Newark on Clinton avenue from Fabian Place to the new city limits. The Consolidated Traction Co. has applied to the Township Committee of Millburn for a franchise to operate cars from the South Orange Township line through Millburn to Summit.

NEW KENSINGTON, PA.—The borough council granted the New Kensington Street Railway Co. a 99-year right of way to lay a single-track trolley car line over Fifth ave., the entire length of the borough from Parnassus to Arnold. T. A. Mellon, Jr., of the Burrell Improvement Co. is President, and D. T. Marsh of Pittsburgh Secretary of the company. Work will be started at once to build a bridge across the Allegheny River at Nineteenth st., Arnold, through which town the franchise has already been promised. The railroad will be continued over the river and connect with the Tarentum Street Railway. (March 4, p. 170.)

PINE BLUFF, ARK.—The city of Pine Bluff has granted to Wilbur W. Harrison of Anderson, Ind., and Nat. Covington of Peru, Ind., a 50 years' franchise for an electric street railway and electric lighting system. These gentlemen have also secured a 10 years' contract with said city for lighting the streets and public buildings. They have four months in which to begin the work of construction, and one year to complete and put the system in operation. In addition to the public lighting they have secured, under written contracts, a large amount of commercial and residence business. Pine Bluff is a city of 18,000 population.

PONTIAC, MICH.—Joseph E. Sawyer of Pontiac and George E. Taylor of Flint are interested in a project to build an electric railroad from Pontiac to Flint.

PORT JERVIS, N. Y.—The Berlin Iron Bridge Co., of East Berlin, Conn., has the contract for building a new power house, car barn and steel bridges for the Port Jervis Electric Railway Co.

ST. LOUIS, MO.—The United Traction Co. has been incorporated by officers of the Union Depot Railway Co. for the purpose of building connecting lines in the interest of the Union Depot company.

The Lindell Railway Co. will make application to the Municipal Assembly for franchises on several additional miles of street.

SEATTLE, WASH.—The Seattle Coal & Railway Co. was incorporated with a capital of \$3,000,000 to build a railroad. Authority is given to use either electric, steam, compressed air or other mechanical power. Among the incorporators are Wilmon Tucker, Pierre P. Ferry and R. F. Guerin.

The West Street and North End Electric Railway Co. contemplates making extensions this year, but its plans are not yet made. The company operates about 10 miles of track. S. L. Shuffleton, President and Treasurer.

SMITH'S FALLS, ONT.—The Smith's Falls, Rideau & Southern Electric Railway recently applied to the Council for permission to lay rails and erect poles.

SOUTH BEND, IND.—The South Bend & Elkhart Electric Railway Co. has filed articles of incorporation, with a capital of \$100,000. The incorporators are De Witt Dilworth, Arthur Kennedy and J. McM. Smith. It is proposed to build a line from Elkhart to Mishawaka, at the latter place to connect with the South Bend Street Railway, and at Elkhart to connect with the Goshen & Elkhart, now building.

SOUTH FRAMINGHAM, MASS.—The Framingham Union Street Railway Co. has petitioned the Railroad Commissioners for authority to increase its capital stock \$20,000, to issue \$10,000 in second mortgage bonds, \$35,000 in debenture bonds, and \$35,000 in coupon notes for the purpose of raising funds necessitated by the change of motive power from horse to electricity.

VICKSBURG, MISS.—Press reports state that Mr. Percival Steele, of Chicago, is interested in an electric railroad projected at this place.

WASHINGTON, D. C.—The House District Committee reported favorably the bill to incorporate the Washington & University Railroad Company (January 21, 1898, p. 51).

Capt. Lansing H. Beach, assistant to the Engineer Commissioner of the District, in his report on the Washington & Gettysburg Railroad Co.'s bill, recommends an amendment that changes the route of entrance into the District, also an amendment providing that the motive power shall be cable, compressed air, electricity, or mechanical power other than steam.

WAUPACA, WIS.—Irving P. Lord, President of the Waupaca Electric Light Co., is, we understand, interested in the electric road to be built between Waupaca, Farmington and Chain o' Lakes. (Mar. 11, p. 189.)

WEBSTER, MASS.—A certificate of incorporation has been issued to the Webster & Dudley Street Railway Co. to build an electric road six miles long. The capital stock will be \$50,000. The temporary Board of Directors is as follows: Edgar S. Hill, John Flint, L. R. Eddy, George R. Merble, Cyprid Dandurand, Charles Haggerty and Oscar Shumway, all of Webster. (Feb. 25, p. 149.)

WEST MANSFIELD, O.—It is stated that Mr. J. M. Conley, proprietor of the Logan County cave resort, is endeavoring to have an electric railroad built in Logan County.

WOONSOCKET, R. I.—The Cumberland Railway Co. has been incorporated with a capital of \$100,000, to build a trolley road between Woonsocket and Pawtucket, there to connect with existing lines to Providence.

GENERAL RAILROAD NEWS.

Railroad Earnings.

Showing the gross and net earnings for the periods ending at the dates named:

January 31: 1898. 1897. Inc. or Dec.

Chicago, Indianapolis & Louisville.

1 month	Gross	\$225,358	\$195,605	I.	\$29,753
1 "	Net	49,436	33,417	I.	16,019
8 months	Gross	2,008,920	1,681,071	I.	327,849
8 "	Net	597,228	494,672	I.	102,556

Missouri, Kansas & Texas.

1 month	Gross	\$1,024,492
1 "	Net	272,259

February 28: 1898. 1897. Inc. or Dec.

Atchison, Topeka & Santa Fe.

1 month	Gross	\$3,056,390	\$2,447,742	I.	\$608,648
1 "	Net	745,722	555,157	I.	190,565
8 months	Gross	26,342,599	22,469,310	I.	3,873,289
8 "	Net	7,467,545	6,299,934	I.	1,167,611

Canadian Pacific.

1 month	Gross	\$1,494,597	\$1,272,094	I.	\$222,503
1 "	Net	423,067	384,823	I.	38,244
8 months	Gross	3,167,225	2,585,018	I.	582,207
8 "	Net	939,295	758,166	I.	181,129

Central of Georgia.

1 month	Gross	\$495,503	\$474,980	I.	\$20,523
1 "	Net	184,217	186,167	D.	1,950
8 months	Gross	4,061,217	3,883,769	I.	177,448
8 "	Net	1,554,672	1,529,592	I.	25,080

Central of New Jersey.

1 month	Gross	\$885,290	\$848,939	I.	\$36,351
1 "	Net	310,500	255,957	I.	54,543
2 months	Gross	1,940,989	1,704,154	I.	236,835
2 "	Net	719,790	511,175	I.	208,615

Chesapeake & Ohio.

1 month	Gross	\$913,390	\$775,707	I.	\$137,683
1 "	Net	273,146	201,834	I.	71,312
8 months	Gross	7,915,507	7,052,484	I.	863,023
8 "	Net	2,621,968	2,368,850	I.	253,118

Chicago & Eastern Illinois.

1 month	Gross	\$337,012	\$322,826	I.	\$14,186
1 "	Net	169,187	146,802	I.	22,385
8 months	Gross	2,915,801	2,668,934	I.	246,867
8 "	Net	1,420,261	1,289,568	I.	130,693

Chicago, Burlington & Quincy.

1 month	Gross	\$3,139,716	\$2,769,462	I.	\$370,254
1 "	Net	406,476	354,139	I.	52,337
8 months	Gross	29,132,583	24,026,428	I.	5,106,155
8 "	Net	4,917,006	3,271,947	I.	1,645,059

Chicago, Milwaukee & St. Paul.

1 month	Gross	\$2,394,660	\$2,119,740	I.	\$274,920
1 "	Net	789,804	785,532	I.	4,272
8 months	Gross	23,186,238	20,865,473	I.	2,320,765
8 "	Net	9,079,421	8,275,001	I.	804,420

Cleveland, Cincinnati, Chicago & St. Louis.

1 month	Gross	\$1,221,556	\$1,069,272	I.	\$152,284
1 "	Net	301,341	209,472	I.	91,869
2 months	Gross	2,536,151	2,108,423	I.	427,728
2 "	Net	679,674	504,288	I.	175,386

Erie.

1 month	Gross	\$2,247,191	\$2,175,542	I.	\$71,649
1 "	Net	396,684	389,933	I.	6,751

Long Island.

1 month	Gross	\$205,268	\$185,963	I.	\$19,305
1 "	Net	*14,914	*22,206	D.	*7,292
8 months	Gross	3,198,712	2,923,567	I.	275,145
8 "	Net	1,025,161	910,405	I.	114,756

* Loss.

Northern Central.

1 month	Gross	\$509,779	\$548,631	D.	\$38,852
1 "	Net	131,784	205,628	D.	73,844
2 months	Gross	1,016,314	1,074,517	D.	58,203
2 "	Net	235,012	361,922	D.	126,910

Northern Pacific.

1 month	Gross	\$1,517,335	\$1,029,595	I.	\$487,739
1 "	Net	596,927	252,947	I.	343,980

Oregon Railroad & Navigation Company.

1 month	Gross	\$497,613	\$257,315	I.	\$240,298
1 "	Net	148,715	62,480	I.	86,235

Pittsburgh, Cincinnati, Chicago & St. Louis.

1 month	Gross	\$1,221,555	\$1,069,272	I.	\$152,283
1 "	Net	301,341	209,472	I.	91,869
2 months	Gross	2,536,151	2,108,424	I.	427,727
2 "	Net	679,674	506,289	I.	173,385

Reading Company:
Philadelphia & Reading Railway Co.
1 month.....Gross \$1,490,115 \$1,494,133 D. \$4,018
1 ".....Net 584,382 629,061 D. 34,679
8 months.....Gross 15,106,751 14,221,566 I. 879,185
8 ".....Net 6,865,102 6,418,861 I. 246,241

Coal and Iron Company.
1 month.....Gross \$1,444,423 \$1,510,196 D. \$65,773
1 ".....Net *27,840 *133,119 D. *105,279
8 months.....Gross 16,771,706 15,865,690 I. 1,206,016
8 ".....Net 735,377 463,668 I. 271,719

* Loss.
St. Louis & San Francisco.
1 month.....Gross \$554,898 \$471,938 I. \$82,960
1 ".....Net 215,311 211,903 I. 3,408
8 months.....Gross 4,689,457 4,008,513 I. 680,944
8 ".....Net 2,038,022 1,780,647 I. 257,375

Southern.
1 month.....Gross \$1,710,073 \$1,570,922 I. \$139,151
1 ".....Net 578,656 508,750 I. 69,906
8 months.....Gross 13,878,803 12,975,471 I. 903,332
8 ".....Net 4,609,062 4,287,897 I. 321,165

Southern Pacific.
1 ".....Gross \$4,336,419 \$3,417,763 I. \$918,656
1 ".....Net 1,551,799 942,967 I. 608,832
6 months.....Gross 37,174,640 33,535,645 I. 3,638,995
8 ".....Net 15,064,218 12,446,412 I. 2,617,806

BALTIMORE & OHIO.—The Receivers have announced that they will pay on April 1 interest on the car float certificates on the loan of 1853, and on the equipment trust Series A. Interest will not be paid on the Philadelphia Division sterling loan and the Parkersburg Branch loan of 1879. The principal of the equipment trust has been arranged for. (March 25, p. 225.)

BENTONVILLE.—This road, according to report, has been sold to J. M. Bayless of Cassville, Mo., President and General Manager of the Cassville & Western. The Bentonville Railroad runs from Bentonville, on the St. Louis & San Francisco, northwest 5.25 miles to Rogers. It is understood that Mr. Bayless proposes to extend the road west in the same county to connect with the Kansas City, Pittsburgh & Gulf.

BOMBAY & MOIRA.—This company was incorporated in New York March 28, as successor to the Saratoga & St. Lawrence, sold to the bondholders at Malone, N. Y., Dec. 4. It extends from Moira, N. Y., north 8.5 miles to Bombay. The Directors are as follows: S. W. Foster, of Knowlton; E. C. Smith, of St. Albans, Vt.; Charles Parsons, of New York City; Louis Hasbrouck, of Ogdensburg, N. Y.; F. D. Kilburn and Thomas Cantwell, of Malone, N. Y. (Dec. 10, 1897, p. 880.)

BOSTON & MAINE.—The bill has become a law authorizing this road to purchase any portion of the stock of its leased and subsidized lines. The object is to give the company power to obtain control of the Maine Central and to reduce its fixed charges through absorbing the subordinate lines. A similar attempt failed last year, but the bill then introduced was a general one giving the same privilege to all railroads. (Jan. 21, p. 51.)

CHESAPEAKE & NASHVILLE.—This road, according to report, has been sold to the Middle & East Tennessee Central for a price not stated. The Chesapeake & Nashville extends from Gallatin, Tenn., northeast to Scottsville, Ky., 35.87 miles. It was sold under foreclosure on Sept. 27, 1892, to W. A. Weber, by whom it has been operated pending the reorganization of the company. The Middle & East Tennessee Central connects with the purchased road at Gallatin, from which it runs southeast to Hartsville, Tenn., 12 miles. The charter calls for an extension of the Middle & East Tennessee Central to Knoxville, 153 miles.

CHICAGO, MILWAUKEE & ST. PAUL.—A high official of this company denies the report referred to by a contemporary, and which has been given wide publicity by the press, that the Chicago, Milwaukee & St. Paul has secured control of the Mason City & Fort Dodge, and proposes extending that line from Lehigh, Ia., southwest to Dedham on its main line. There was some talk about five years ago of obtaining control of this line, but nothing has ever been done. There is no extension contemplated of the Mason City & Fort Dodge.

COLUMBUS, HOCKING VALLEY & ATHENS.—The Supreme Court at Columbus, O., March 22, decided the act constitutional authorizing the sale of the Hocking Valley & Athens Canal to this company. Suit was begun early last year against the state of Ohio by the bondsmen of this road to enforce their liability on a bond for \$100,000 given to assure the state that the road would be built within two years from May 18, 1894. The company was organized in April of that year to lease the bank of the Hocking Valley & Athens Canal extending from Carroll to Nelsonville, 42 miles, and to use it as a road-bed. Afterward the right of the state to make such a lease being questioned, the railroad agreed to pay \$50,000 cash and \$10,000 annual rental for the canal. The proposed line is to extend from Columbus, O., to Athens, 70 miles, and the projectors of the road say it will now be built. (Feb. 5, 1897, p. 105.)

DETROIT, TOLEDO & MILWAUKEE.—A mortgage has been filed by this company in favor of the Central Trust Co. of New York covering all its property between Toledo, O., and Allegan, Mich., to secure an issue of \$3,150,000 of 5 per cent. first mortgage bonds. This company last year acquired the Michigan Division of the Cincinnati, Jackson & Mackinaw. (Sept. 17, 1897, p. 659.)

ERIE.—The New Jersey House has passed the Senate bill confirming the lease of the New York, Susquehanna & Western to the Erie. (March 25, p. 226.)

KANSAS & TEXAS COAL.—The stockholders of this company will vote April 21 on the proposition to issue \$145,000 first mortgage bonds.

KANSAS CITY, OSCEOLA & SOUTHERN.—A contract has been closed between this company, the Kansas City Suburban Belt and the St. Louis & San Francisco, giving the right of way to this company into Kansas City over the line of the Suburban Belt. The Kansas City, Osceola & Southern has an agreement with the St. Louis & San Francisco for building connection from Osceola, Mo., to Bolivar, which, when completed, will give the St. Louis & San Francisco direct communication with Kansas City. (Nov. 12, 1897, p. 806.)

LAKE SHORE & MICHIGAN SOUTHERN.—The bonds of the Buffalo & Erie due April 1 will be paid at maturity at the office of the United States Trust Co., New York.

LOUISVILLE & NASHVILLE.—General mortgage bonds to the value of \$251,000 payable at 110 per cent. on June 1 have been called for payment at the office of the Central Trust Co., New York. Cecelia Branch bonds for \$55,000 will be redeemed at par Sept. 1 at the office of the Union Trust Co., New York. (March 25, p. 226.)

MICHIGAN CENTRAL.—With reference to the proposed control of the Michigan Central by the New York Central & Hudson River, President Ledyard is reported to have said as follows:

When the New York Central made its arrangements to control the Lake Shore & Michigan Southern, the plan included the acquiring of a like control of the Michigan Central. No definite action has yet or can be taken until the return from Europe of Mr. Cornelius Vanderbilt, who is Chairman of the Michigan Central and one of its largest stockholders. Mr. Vanderbilt is expected to return to this country some time this summer. Beyond this there is nothing that I can say to make the situation clearer. Eventually the Michigan Central will become the property of the New York Central and a part of its system.

MOUNT CARMEL & NATALIE.—Suit was entered in the Common Pleas Court at Pittsburgh, Pa., March 29, in behalf of Thomas C. Lazear, the Tradesmen's National Bank, the Pittsburgh Bank for Savings and the German National Bank, asking for a Receiver to take charge of this road and to sell it with the Natalie Coal Co. The railroad company on June 1, 1891, issued 5 per cent. gold sinking fund 25-year bonds to the amount of \$175,000, which bonds are held by the parties bringing the suit. It is charged that the interest is overdue, that the company is insolvent and is practically worthless without freight from the Natalie Coal Co., whose mines it connects with the Philadelphia & Reading. The road extends from Natalie, Pa., to Alaska, 7 miles. It was opened in 1891, and is operated by the Philadelphia & Reading under contract to continue until March 20, 1911. The capital stock is \$175,000, and 3,420 shares of the total 3,750 are owned by Thomas C. Lazear, one of the parties bringing suit.

NORTHERN PACIFIC.—The 4 per cent. prior lien bonds have been increased from \$84,198,500 to \$85,062,000 to include \$863,500 bonds issued in exchange for \$705,000 general first mortgage 6 per cent. bonds. The general first mortgage bonds now outstanding are \$9,836,000. (Feb. 11, p. 112.)

PECOS VALLEY.—The date of the sale of this road has been fixed at April 19, to take place at Eddy, N. M. (March 18, p. 210.)

SHELBYVILLE & BLOOMFIELD.—This company has been incorporated in Kentucky with a capital stock of \$10,000 to be the successor to the Northern Division of the Cumberland & Ohio, purchased on Dec. 13 for the Southern Railroad. The line extends from Shelbyville, Ky., southwest 26.7 miles, to Bloomfield. The incorporators are: Samuel Spencer, Josiah Hill and R. D. Larkford of New York; George R. Loyall, A. P. Humphrey, Edward Fitzgerald and H. H. Taylor of Louisville, Ky. (Feb. 4, p. 90.)

SOUTH JERSEY.—This road was sold at public auction for \$300,000 in Winslow Junction, N. J., at 3 p. m., March 29, to Robert P. Linderman, representative of the Reorganization Committee and President of the Bethlehem Iron Co. It extends from Winslow Junction to Cape May, 54.1 miles, with a branch from Tuckahoe to Sea Island, 12.1 miles. A receiver was appointed in August, 1894. (March 4, p. 171.)

UNION PACIFIC.—The Mercantile Trust Co. of New York makes announcement to various holders of certificates for first mortgage bonds of the Kansas Pacific and Leavenworth branches that it will be prepared to issue new securities in exchange for the same on and after March 24. At the foreclosure sale on March 23, Kuhn, Loeb & Co., of New York purchased the various securities described in this column for Feb. 25 (p. 150) for \$4,510,000.

WASHBURN, BAYFIELD & IRON RIVER.—The Supreme Court of Wisconsin has rendered decision to give this company immediate possession of \$100,000 in bonds voted by the people on the line two years ago, which have been earned by the completion of the first 20 miles of road. It is stated that the company will begin work at once to push the road to completion. The line extends from Washington, Wis., west to Iron River, with a branch northeast to Bayfield. All the grading has been completed.

WISCASSET & QUEBEC.—Attachments have been placed on the property of this company as follows: First National Bank of Wiscasset, Me., \$12,000; W. D. Patterson, \$8,000; G. P. Farley, \$3,000; S. E. Hopkins, A. M. Card, Andrew Lacey, W. D. Patterson and Lewellyn Libby, \$25,000; A. Crosby, E. B. Besse, Thomas Dinsmore, S. E. Hopkins, A. M. Card, Andrew Lacey, W. D. Patterson and F. L. Libby, \$22,000. Most of these men are connected with the road. According to press reports, the action is taken to reorganize the company and form a consolidation with the Canadian Pacific, to which end the road is to be extended north and widened to broad gage. The line as now operated extends from Wiscasset, Me., north to Albion, 43.5 miles, and an extension is nearly completed from Albion through Burnham to Pittsfield, 18 miles. (Jan. 21, p. 51.)

WISCONSIN CENTRAL.—This company has filed a demurrer to the petition of Mark T. Cox of Morristown, N. J., who claimed that the operations of the company have impaired the value of property of the Central Car Co. (March 18, p. 210.)

The Northwestern Lumber Co. of Stanley, Wis., which operates a road from that place on the Wisconsin Central, running north 27 miles, is reported to be about to extend its line north to Hawkins on the Minneapolis, St. Paul & Sault Ste. Marie.

Electric Railroad News

ASBURY PARK, N. J.—The Asbury Park & Belmar Street Railway was sold at foreclosure sale to Mr. G. B. M. Harvey and A. C. Hartshorne, of Freehold, N. J., for \$53,000. Mr. Harvey is treasurer of the Atlantic Coast Electric Railroad Co., of Long Branch.

BALTIMORE, MD.—The uncompleted Columbia & Maryland Railway was sold March 25 to Mr. Nicholas P. Bond, president of the Baltimore Security and Trading Company, for \$450,000. The property was first offered in three divisions, the first including the Edmondson Avenue, Catonsville & Elliott City Railway and power houses. This was bid up to \$150,000. The second, which was bid up to a similar amount, consisted of 10,625 shares of stock out of a total of 10,640 shares of the Eckington & Soldiers' Home Railway, of Washington; also 5,000 shares of the Belt Line Railway, of that city, and all the stock and bonds of the Maryland & Washington Railroad. The third lot, on which \$35,000 was bid, included stocks and bonds of the Catonsville Short Line, now in operation. The total of the separate bids was only \$335,000, so that the lump bid of \$450,000 was promptly accepted. The road will be reorganized, but will not be operated through to Washington for some time.

CHICAGO, ILL.—The Union Elevated Railroad has issued an additional \$287,000 of first mortgage bonds upon construction account of railroad structure, power house and machinery. This makes a total of \$4,212,000 of first mortgage bonds outstanding.

CINCINNATI, O.—The Cincinnati Street Railway Co. has announced an increase in its stock of \$656,000. The stockholders will be given the privilege of subscribing to the new stock at par.

CLEVELAND, O.—Judge Neff in Common Pleas Court rendered a decision in the case of Frank de Haas Robison against John J. Shipherd and the Cleveland City Railroad Company. The court held that a referee should be appointed to determine how much spurious stock was overissued by the directors of the road and to whom; that the directors should be enjoined from issuing any more treasury stock.

DENVER, COL.—The following named gentlemen announce that they are acting as a committee representing the first mortgage bondholders of the Denver City Railroad: F. P. Olcott, chairman; William L. Bull, Charles H. Merriman, David S. Baker, Arthur K. Hunt. The committee requests the deposit of said bonds with the Central Trust Co. of New York, 54 Wall street, under terms of a bondholders' agreement (copies to be had from Central Trust Co.). Adrian H. Joline is counsel and J. N. Wallace, 54 Wall street, New York, is secretary to the committee.

HINGHAM, MASS.—The Railroad Commissioners have approved an increased issue of \$28,500 of the capital stock of the Hingham Street Ry. Co. for the purpose of retiring by exchange the capital stock of the Hull Street Ry. Co. The board also approves an issue of \$14,000 5 per cent. 20-year bonds for paying and funding the floating debt of the Nantasket Electric Street Ry. Co. consolidated with the Hingham Street Ry. Co.

NEWARK, N. J.—The stockholders of the Consolidated Traction Co., at their annual meeting in Jersey City, March 28, voted to lease their franchises and plant to the North Jersey Street Railway Company. Before the proposed lease was taken up for consideration the old Board of Directors for the Consolidated Traction Company was re-elected. Isaac Waterbury of the Manhattan Trust Co. of New York, which holds the Traction Co.'s bonds, attended the meeting and took part in the discussion of the lease. The leased company is capitalized at \$15,000,000, and the lease provides for a guaranteed dividend of at least 2 per cent. for the first year and a slight annual increase for eight years. When the lease is consummated, which will be in the course of a few weeks, the North Jersey company will control all the trolley lines in the northern part of the state with the exception of those operated by the North Hudson County Railway Company in Hoboken, Jersey City Heights and the northern section of the county. It is stated that the new organization is to have a capital stock of \$25,000,000.

NEW ORLEANS, LA.—A press dispatch says that Mr. George W. Norton of Louisville, Ky., has resigned from the directory of the New Orleans Traction Co. Mr. Norton is a member of the committee of Louisville stockholders, and the duties of the two positions would conflict. Mr. Seligman has also resigned from the reorganization committee in order that he may treat with it for the holders of the \$1,500,000 collateral trust notes.

NORFOLK, VA.—The Norfolk & Ocean View Railroad was sold at foreclosure to Mr. R. L. Williams, of Richmond, president of the Norfolk Street Railroad. The purchase price is said to be \$329,000. The amount due for principal of bonded indebtedness was \$300,000. The Norfolk & Ocean View is a trolley road nine miles long and has been in the hands of a receiver since April, 1896.

OGDEN, UTAH.—W. H. Rowe, Vice-President of the Ogden Electric Railway Co., has resigned, according to reports.

TRAFFIC.

Traffic Notes.

A Car Service (Demurrage) Association has been formed at Butte, Mont.

It is reported that westbound freight rates from Buffalo are somewhat demoralized in consequence, it is said, of the opening of the Wabash line from that city.

Mr. F. J. Gates, freight agent of the Atchison, Topeka & Santa Fe, at Gainesville, Tex., has received from the company a prize of \$150 for showing the largest increase in freight business for the six months ending December 1 last.

Press dispatches from San Francisco report that passenger traffic to Alaska shows signs of falling off. Twenty-six San Francisco steamers are now engaged in the Alaska traffic, and thirteen more vessels are on the way from the East to take part in the same trade.

Reports from Mackinaw City, Mich., March 28, stated that the straits were open, a southwest gale having driven the ice into Lake Huron. This is the earliest opening of the straits since records were begun in the year 1835.

The Canadian Pacific has reduced the passenger fare from Winnipeg to Montreal from \$38.90 to \$28.20

(first class). Second class rates are also reduced and the reduction applies to Toronto. The Philadelphia & Reading has made radical reductions in passenger fares from Philadelphia to Frankford, Fox Chase and other suburban stations.

At Galveston, Tex., March 23, the United States Circuit Court granted an injunction restraining the Missouri, Kansas & Texas; the Gulf, Colorado & Santa Fe; the Texas & Pacific, the International & Great Northern, the St. Louis & Southwestern and the Texas and New Orleans from enforcing the notices which they recently gave to the effect that they would not receive freight from the Kansas City, Pittsburgh & Gulf, except on prepayment of charges at local rates. The writ is made returnable at Paris, Tex., on April 15.

State Rate-Making.

If a state sets out to regulate railroad traffic in such minute details as adjusting rates to every inequality of circumstances that may develop, it is likely to very soon find it necessary to abandon the customary slow methods that are usually supposed to be necessary in order to secure justice and sustain the dignity of a state, and to hustle around just like any ordinary traffic manager. An incident illustrating this recently occurred in Texas, as shown by the following circular, published in a Galveston paper, and signed by the three state railroad commissioners:

"Austin, Tex., March 15.—Positive information having been received by the commission to the effect that the rates on bagging for baling cotton, and cotton ties and buckles, in carloads, from points outside of Texas to points within the state have not been reduced 10 cents per 100 lbs., but that the announcement of such a reduction was erroneously made in the office of the Southwestern Freight Bureau and published by the Associated Press, and the cause for the order of the commission as set forth in its circular No. 590, dated March 4, 1898, having been thus removed, it is hereby ordered that said circular No. 590 be canceled, and that the rates of commodity tariff No. 14, applying on bagging for baling cotton, and cotton ties and buckles, in carloads, which were suspended by circular No. 590, be reinstated.

"This order shall take effect March 16, 1898."

Chicago Traffic Matters.

Chicago, March 30, 1898. Eastbound shipments during the month just closing have surpassed all previous records out of Chicago, having averaged close to 175,000 tons each week during the month. All important commodities have been carried at rates far below tariff. An order was issued for a restoration of rates on the first of the month, but it seems to be already a dead letter, for, in order to meet the lake competition, the railroads have been making contracts at figures far below tariff. These contracts run far into the summer.

The Santa Fe has given notice that on April 8 it will put into effect a rate of 8 cents per 100 lbs. on packing house products from the Missouri River to Mississippi River points and of 13 cents to Chicago. This is a reduction of 10½ cents below normal rates.

The question of running time of trains between Chicago and Kansas City is again up. The Alton announces that within the next ten days it will reduce its fastest train from 15½ hours to 13 hours, and the Rock Island, which has the longest route, threatens to cut fares in retaliation.

It appears that the decision of Arbitrator Caldwell on Denver fares prescribes an excess of \$4 for sleeping car passengers on the fast trains, and only \$1 excess for passengers in day cars. This is not relished by the roads running these trains and it is said also that passengers do not take kindly to the arrangement.

A reduction of three cents per 100 lbs. in the flour rate from St. Paul and Minneapolis to the Atlantic seaboard has been authorized by both the all-rail and lake and rail lines.

The Western Joint Traffic Bureau is now a thing of the past. The decision to discontinue the bureau was not unexpected. It has been expensive and since the trans-Missouri decision of the United States Supreme Court it has had no influence over rates. The only practical benefit derived from it was in the issuance of joint freight tariffs. The railroads are under contract to pay until Jan. 1, 1899, the salaries of four of the commissioners, at the rate of \$10,000 a year each. Although not bound by any agreement with Chairman Midgley, it is said that they will pay him for several months longer at the rate of \$15,000 a year, although his services will not be given after this month. Mr. Midgley says that he has no other position in view, and expects to make a visit of several months to Europe. For over twenty years he has been at the head of various freight organizations of the Western roads. The committee to which was referred the matter of drafting a new agreement has ready for consideration some kind of a scheme forming another freight association or tariff bureau. C. A. Parker, vice-chairman of the old organization, will probably be placed at the head of the new one.

Under the recent decision of the Interstate Commerce Commission, requiring railroads either to publish storage charges in tariffs or refrain from imposing such charges, it has been decided to publish them in the tariffs.

Both the Northern Pacific and the Great Northern roads have refused to submit to arbitration the question of whether the Canadian Pacific is entitled to a differential on Alaska business and that fight is as far from settlement as ever.

Eastbound shipments from Chicago and Chicago junctions to points at and beyond the Western terminus of the trunk lines for the week ending March 24 amounted to 192,901 tons, as compared with 199,550 tons the preceding week. This statement includes 112,155 tons of grain, 31,845 tons of flour and 14,324 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	Week Ending March 24.		Week Ending March 17.	
	Tons.	P. C.	Tons.	P. C.
Baltimore & Ohio.....	16,225	8.4	15,039	7.5
C. C. C. & St. Louis.....	23,935	12.4	17,785	8.9
Erie.....	18,550	9.6	20,390	10.2
Grand Trunk.....	13,946	7.2	20,190	10.1
L. S. & M. S.....	30,069	15.6	27,488	13.8
Michigan Central.....	33,057	17.1	30,116	15.1
N. Y., Chi. & St. L.....	19,909	10.3	22,150	11.1
Pitts., C. C. & St. L.....	10,696	5.6	14,069	7.0
Pitts., Ft. Wayne & Chi.....	18,656	9.7	21,283	10.7
Wabash.....	7,858	4.1	11,100	5.6
Totals.....	192,901	100.0	199,550	100.0